

EPA REGION VIII  
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DOC ID # 237011  
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IMAGERY COVER SHEET  
UNSCANNABLE ITEM

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SITE NAME Licdn Cotter

OPERABLE UNIT \_\_\_\_\_

REPORT OR DOCUMENT TITLE Cotter Corporation Consent Decree

DATE OF DOCUMENT April 4, 1988

DESCRIPTION OF IMAGERY Oversized Maps of  
Canon City Mill Rap Activity Map & Well monitoring  
Locations

NUMBER AND TYPE OF IMAGERY ITEM(S) 2

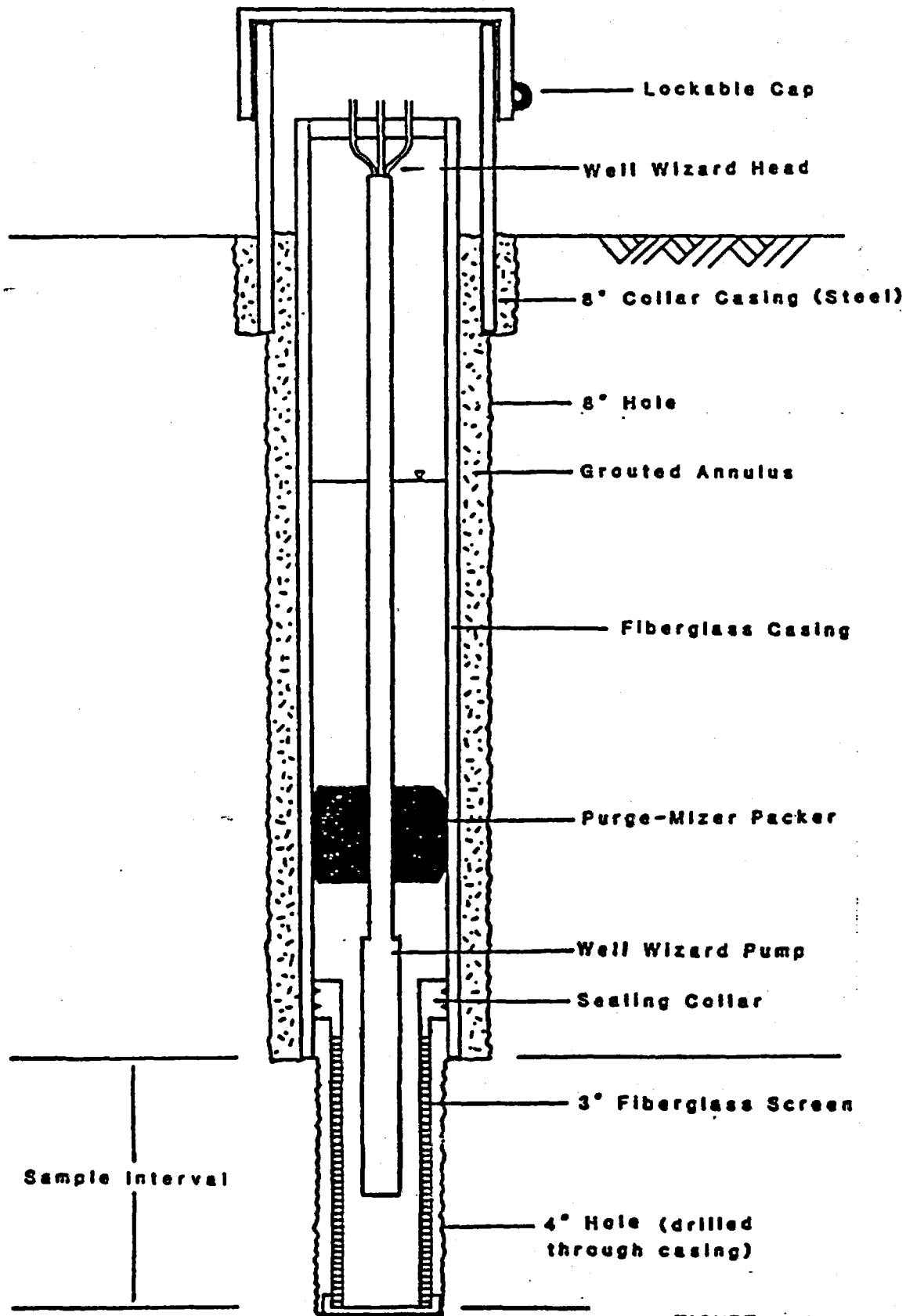
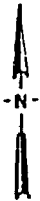
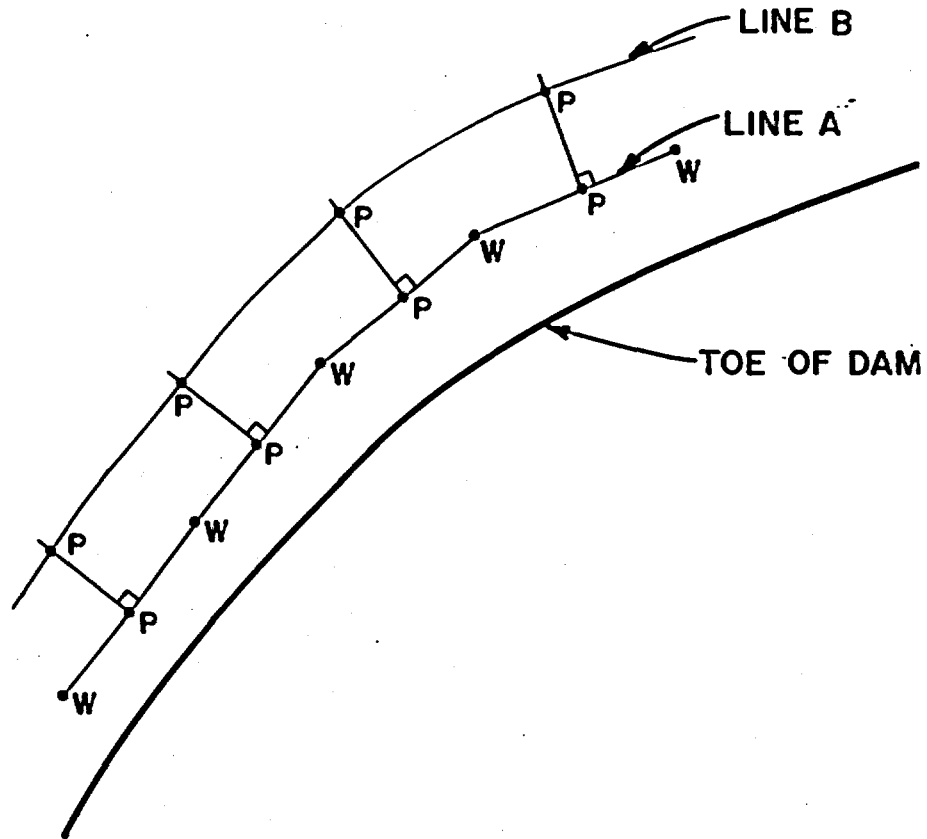


FIGURE 3-1

COTTER CORPORATION

CLASS A WELL DESIGN



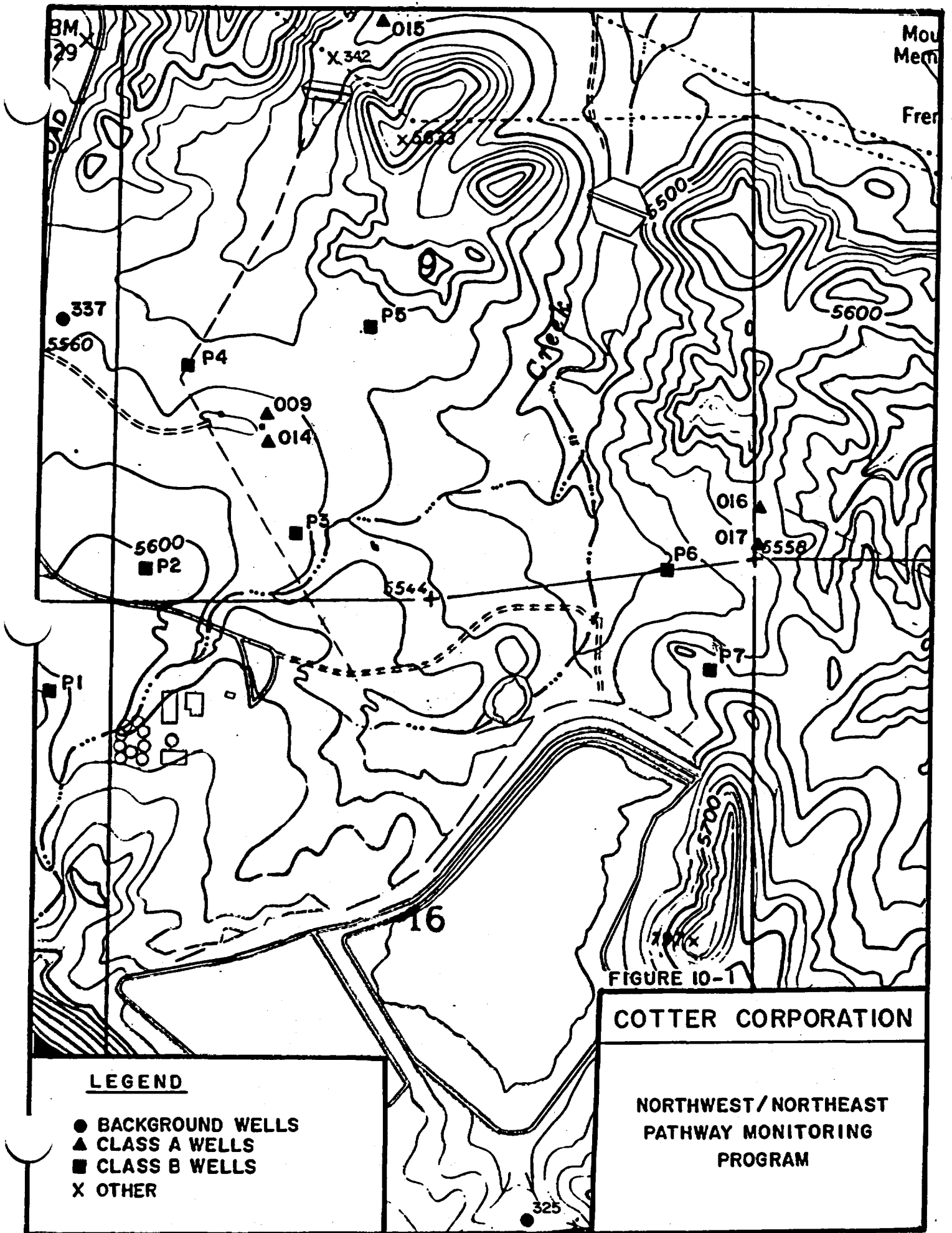
W = Withdrawal Well  
 P = Piezometer

No Scale

FIGURE 4 - 1

**COTTER CORPORATION**

Conceptual Representation  
 of Withdrawal Well and  
 Piezometer Configuration  
 which would be Acceptable  
 to the State

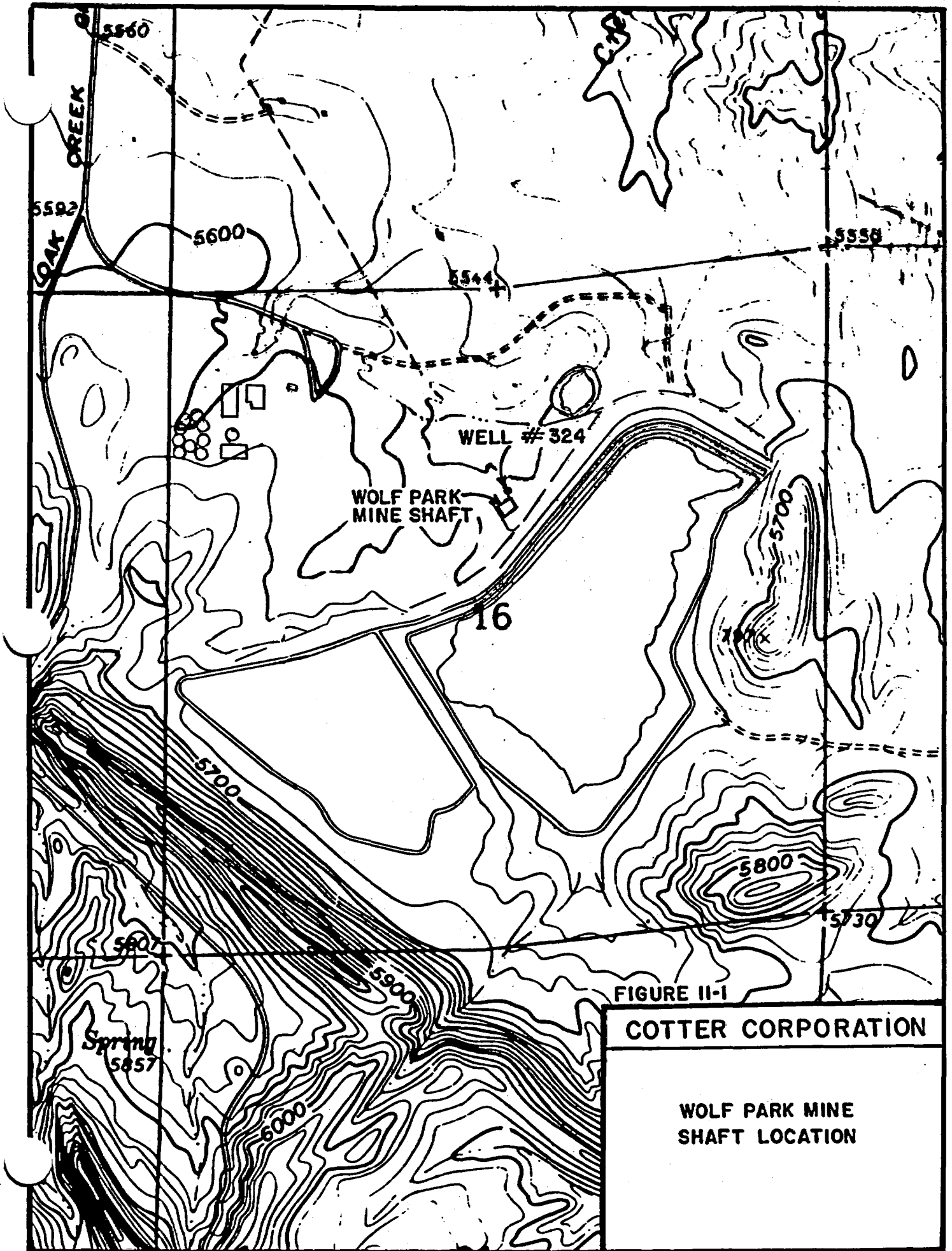


**LEGEND**

- BACKGROUND WELLS
- ▲ CLASS A WELLS
- CLASS B WELLS
- X OTHER

**COTTER CORPORATION**

**NORTHWEST/NORTHEAST  
PATHWAY MONITORING  
PROGRAM**



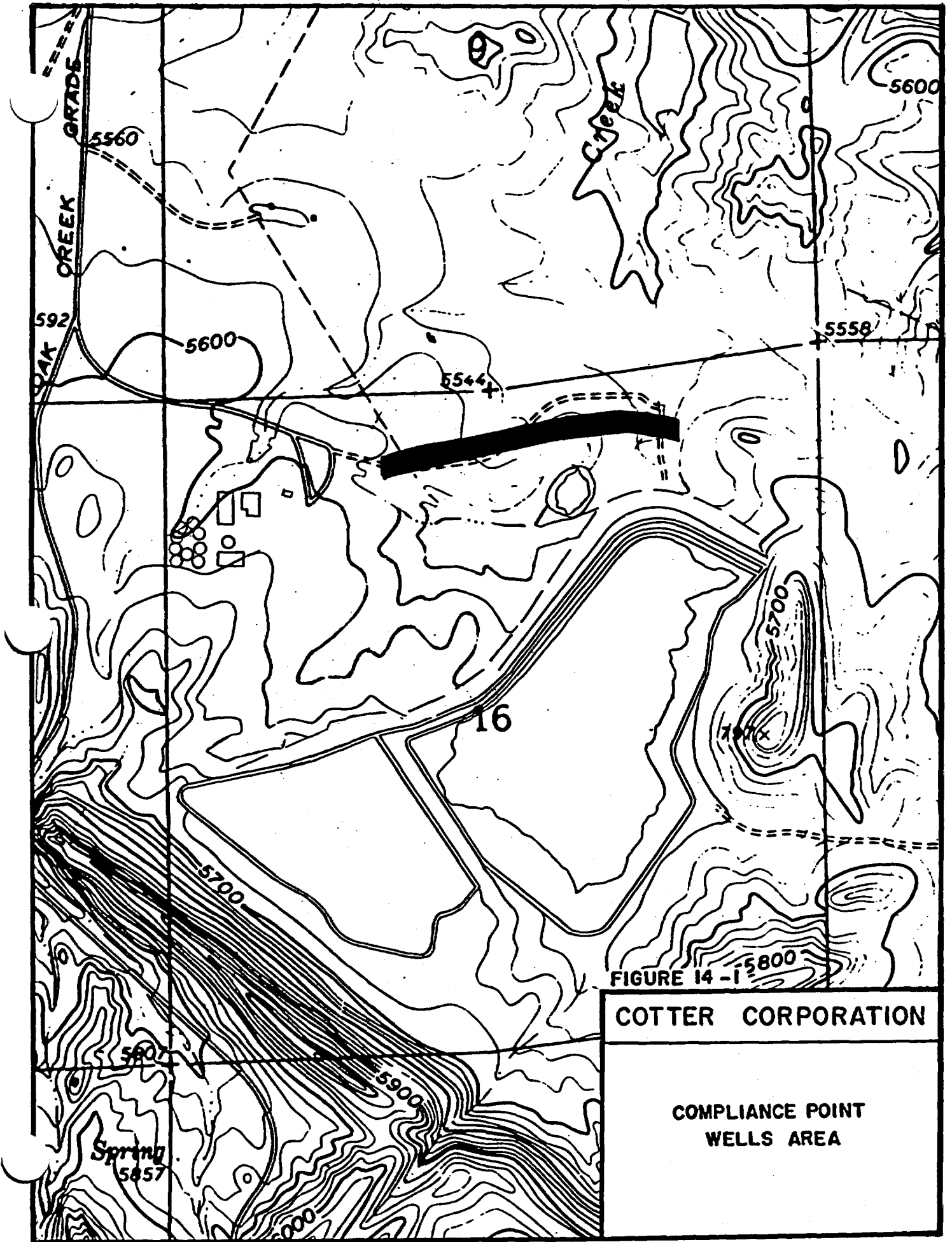
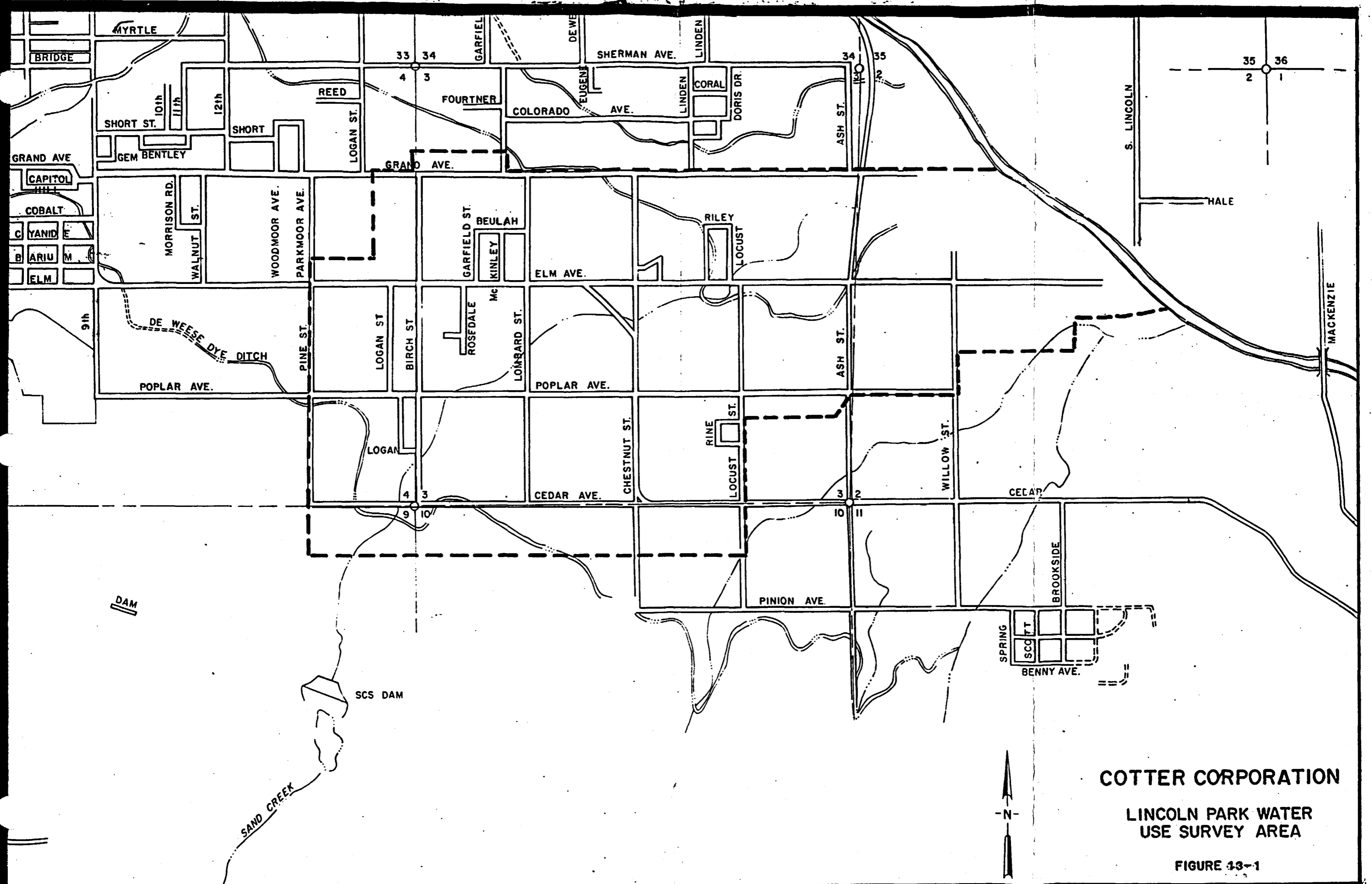


FIGURE 14 - 15800

COTTER CORPORATION

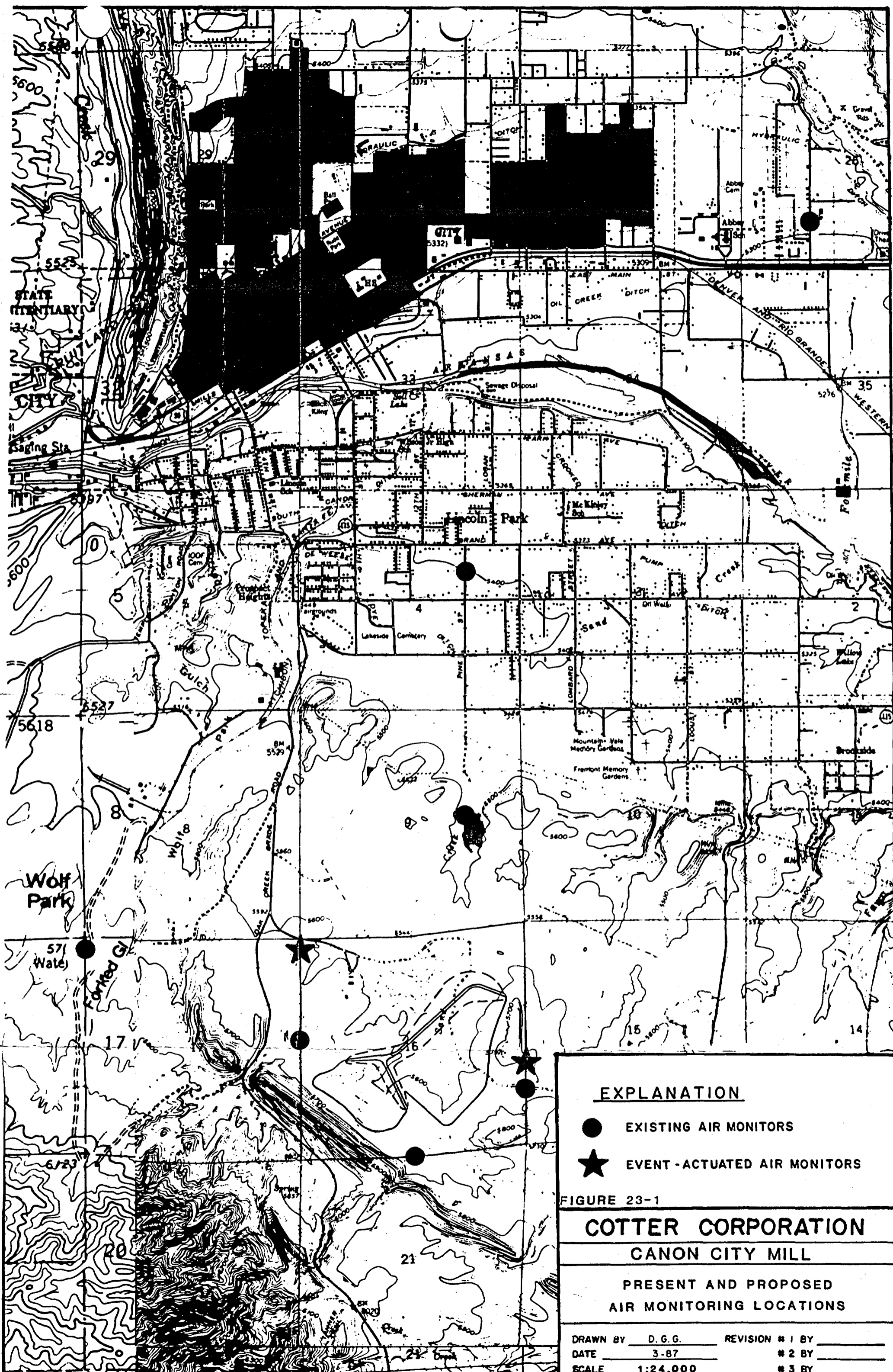
COMPLIANCE POINT  
WELLS AREA



**COTTER CORPORATION**

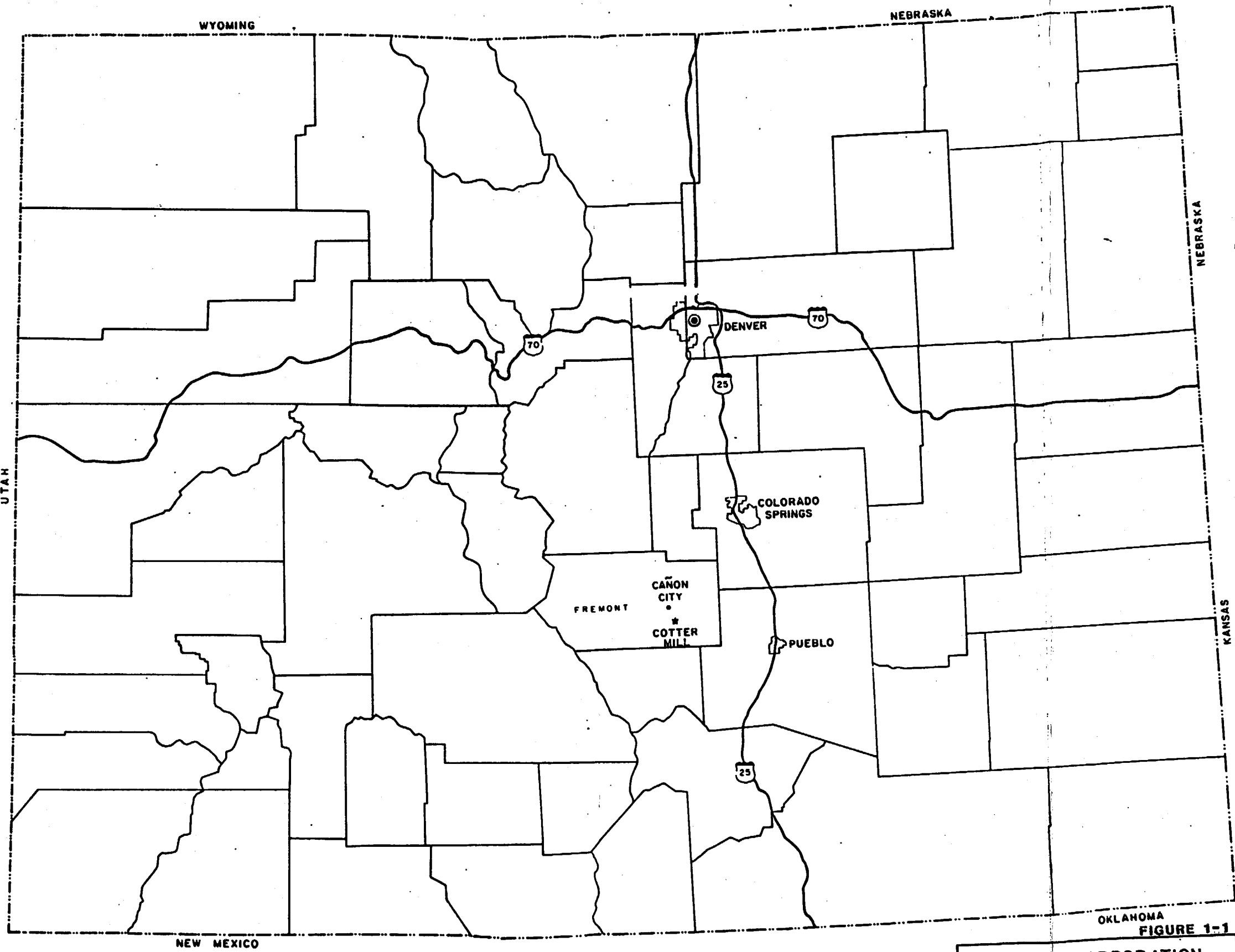
**LINCOLN PARK WATER  
USE SURVEY AREA**

FIGURE 13-1



<b>EXPLANATION</b>	
●	EXISTING AIR MONITORS
★	EVENT-ACTUATED AIR MONITORS
FIGURE 23-1	
<b>COTTER CORPORATION</b>	
<b>CANON CITY MILL</b>	
PRESENT AND PROPOSED AIR MONITORING LOCATIONS	
DRAWN BY	D. G. G.
DATE	3-87
SCALE	1:24,000
REVISION # 1 BY	_____
# 2 BY	_____
# 3 BY	_____





OKLAHOMA  
**FIGURE 1-1**

<b>COTTER CORPORATION</b>	
<b>CAÑON CITY MILL</b>	
<b>MILL LOCATION MAP</b>	
DRAWN BY <b>D.G.G.</b>	REVISION #1
DATE <b>6-87</b>	#2
SCALE 0  30 MILES	#3



# STATE OF COLORADO

Bill Owens, Governor  
Jane E. Norton, Executive Director

*Dedicated to protecting and improving the health and environment of the people of Colorado*

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Laboratory and Radiation Services Division  
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Colorado Department  
of Public Health  
and Environment

December 14, 1999

Jim Cain  
Environmental Coordinator/Radiation Safety Officer  
Cotter Corporation Canon City Operations  
0502 Fremont County Road 68  
Canon City, Colorado 81212

Re: Colorado Radioactive Material License No. 369-01

Dear Mr. Cain:

As requested in your letter of December 3, 1999, this acknowledges incorporation of revised pages 17 and 18, describing Cotter's commitment to a permeable reactive treatment wall (PRTW), into the License Condition 11.9 *Liquids and Solids Management Plan* for Cotter Corporation's Canon City, Colorado, uranium mill site.

Paragraph two of your December 3<sup>rd</sup> letter satisfies License Condition 16 of Colorado Radioactive Material License No. 369-01 at this time. Phil Stoffey of this Division will be providing comments on the November 22, 1999, *Preliminary Design for a Permeable Reactive Treatment Wall Down Gradient from the SCS Barrier and Dam*.

If you have any questions, please contact me at (303) 692-3058.

Kenneth L. K. Weaver, Environmental Protection Specialist  
Laboratory and Radiation Services Division

xc: Steve Landau, Cotter Lakewood  
Marc Herman, USEPA  
Annette Quill, AGO  
George Carnes, HMWM  
Phil Stoffey



The State of Colorado

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OFFICE OF THE ATTORNEY GENERAL

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Duane Woodard  
Attorney General  
Charles B. Howe  
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Richard H. Forman  
Solicitor General

MEMORANDUM

TO: Albert Hazle  
Director  
Radiation Control Division  
Colorado Department of Health

FROM: Joe E. Montoya  
Legal Assistant *J.E.M.*  
CERCLA Litigation Section

RE: State of Colorado v. Cotter Corporation, 83-C-2389

DATE: February 22, 1988

Enclosed is a copy of Cotter Corporation's Responses to Public Comments and Motion for Hearing Regarding Public Comments which were filed on February 19, 1988. Also enclosed is a copy of the Final Consent Decree, Order, Judgment and Reference to Special Master and the Final Remedial Action Plan.

JEM:jmb

Enclosure

cc: Jake Jacobi (w/enc.)

Jmsb:

IN THE UNITED STATES DISTRICT COURT  
FOR THE DISTRICT OF COLORADO

Civil Action No. 83-C-2389

STATE OF COLORADO,

Plaintiff,

vs.

COTTER CORPORATION, a New Mexico corporation,

Defendant

---

MOTION OF COTTER CORPORATION FOR HEARING  
REGARDING PUBLIC COMMENTS

---

Cotter Corporation ("Cotter"), by the undersigned attorneys, requests that, following the Court's review of the public comments and the parties' responses thereto, and if the Court desires such a hearing, the Court schedule a hearing to address certain public comments on the proposed settlement of this lawsuit. In support of its request, Cotter states as follows.

1. Cotter informs the Court that in order to construct the hydrologic barrier at the SCS dam, a major component of the remedy, during 1988, construction site dewatering must begin this spring. In order to accomplish this, the optimum schedule to perform activities required by the RAP would have required activities to begin on January 18, 1988. Thus, as of this filing, remedy implementation is already five (5) weeks behind schedule. Each day of delay is critical to the project. Thus, prompt entry of the final Consent Decree is imperative.

2. On December 11, 1987, the State of Colorado ("State") and Cotter filed with this Court their proposed settlement of this case encompassed in a proposed Consent Decree and Remedial Action Plan ("RAP").

3. A public meeting was held in Canon City on January 5, 1988 to receive public comment on the proposed Consent Decree and RAP.

4. In addition to written comments submitted to the State by other non-parties, the United States Environmental

Protection Agency ("EPA") submitted to the Court both technical and non-technical comments. Technical comments were submitted on January 15, 1988 and, pursuant to an order of the Court dated January 25, 1988 extending the comment period, the EPA submitted non-technical comments to the Court on January 29, 1988. Additional comments, clarifying EPA's non-technical comments of January 29, 1988 were submitted to Cotter and the State on February 12, 1988.

5. Concurrently with this motion, Cotter and the State have separately filed their responses to public comments, including responses to the EPA comments. Cotter and the State have also filed a Joint Motion for Entry of Final Consent Decree, Order, Judgment and Reference to Special Master.

6. In response to the public comments, the parties agreed upon several changes to the RAP, which further ensure that the remedy, when implemented, will protect the public health and the environment. The modifications of the RAP are fully described in the Joint Motion for Entry of Final Consent Decree, Order, Judgment and Reference to Special Master.

7. Seventy (70) comments were received during the public comment period, in addition to the numerous questions and comments addressed during the January 5 public meeting. Among the comments, EPA's lengthy comments purport to raise substantial questions concerning the remedy specified in the proposed Consent Decree and RAP. As more fully addressed in the responses to public comments, Cotter submits that the EPA comments are, in large measure, groundless. The EPA comments are frustratingly devoid of any remnant of an institutional memory within the agency concerning the Cotter site. The EPA reviewers obviously are confused and uninformed about essential site characteristics that have driven negotiation of the RAP for the last two years.

8. As the Court knows, the State is the lead agency for the site under a Memorandum of Agreement ("MOA") between the State and EPA. Pursuant to the MOA, throughout the settlement negotiations, the State assured Cotter that the EPA was fully informed of the progress of the settlement discussions, including the details of the RAP.

9. It is readily apparent that, despite the labors of Cotter, the State and Judge Dana, EPA regards the proposed settlement as an ephemeral, insubstantial remedy, subject to destruction without recourse at the whim and will of EPA -- a non-party to the litigation -- either now or any time in the future. If EPA's position were to be accepted, then the settlement now before the Court will be a nullity.

10. The parties to this lawsuit have submitted extensive responses to the EPA comments for the Court's review. The central themes of those responses are:

a. The EPA is confused about essential portions of the proposed remedy. The parties have attempted to clarify those areas of confusion; and

b. The EPA is surprisingly ignorant with respect to site characteristics and various reports, studies (a number of which were commissioned by the EPA) and data which have been in EPA's possession for years. This failure of the agency's "institutional memory" appears to be derived from frequent personnel changes over the last several years. Cotter understands that the EPA is now reviewing the proposed settlement using their fifth outside consultant, fourth agency project manager and third agency lawyer.

11. Despite regular opportunities to comment and participate, EPA waited until the last day and indeed requested an extension of time, to develop its unfounded criticisms of the proposed settlement.

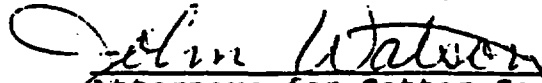
12. Cotter submits that the Court should not treat the EPA comments in a manner that is significantly different from an expression of concerns EPA might submit if this case had gone to trial. In other words, a trial to judgment would not, in the normal course, be affected by non-party expressions of concern. EPA is not a party to the Idarado lawsuit, either. It is a fortuity of settlement that EPA, as a latter-day non-party commentator, has raised issues about the Consent Decree and RAP that may place the settlement in jeopardy.

13. In any event, the Consent Decree contains specific provisions for identifying and dealing with any future contingency that could have any material adverse effect on human health or the environment. This Court's jurisdiction will continue indefinitely for just such purposes.

WHEREFORE, Cotter asks that if, following its review of the public comments and the parties' responses thereto, the Court deems further oral response by the parties necessary, the Court set a hearing as soon as the Court's docket permits to resolve the effect of the comments submitted by the EPA and the general public concerning the proposed settlement of this lawsuit. The undersigned has been authorized by counsel for the State to represent to the Court that the State does not object to the scheduling of such a hearing.

Respectfully submitted,

HOLME ROBERTS & OWEN  
A. Edgar Benton  
John L. Watson

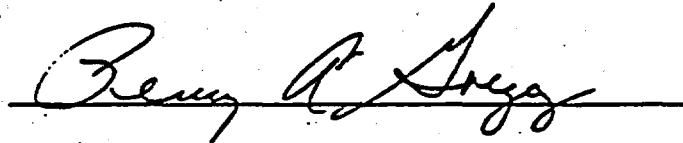


Attorneys for Cotter Corporation  
1700 Broadway, Suite 1800  
Denver, Colorado 80290  
(303) 861-7000

CERTIFICATE OF MAILING

I HEREBY CERTIFY that a true and correct copy of the foregoing MOTION OF COTTER CORPORATION FOR HEARING TO REGARDING PUBLIC COMMENTS was hand delivered this 19th day of February, 1988, addressed to the following:

Carolyn L. Buchholz, Esq.  
CERCLA Litigation Section  
Office of the Attorney General  
1560 Broadway, Suite 250  
Denver, Colorado 80202



Jacobi

IN THE UNITED STATES DISTRICT COURT  
FOR THE DISTRICT OF COLORADO

Civil Action No. 83-C-2389

STATE OF COLORADO,

Plaintiff,

vs.

COTTER CORPORATION, a New Mexico corporation,

Defendant

---

COTTER CORPORATION'S RESPONSES TO PUBLIC COMMENTS

---

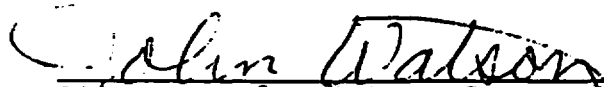
Cotter Corporation ("Cotter"), by the undersigned attorneys, submits for filing its responses to public comments.

1. Cotter hereby submits its responses to the comments of the Environmental Protection Agency ("EPA"). Such comments are attached hereto as Attachment A.

2. Except for the responses to the EPA comments prepared by the State of Colorado (the "State"), Cotter incorporates by this reference the responses made by the State to the other public comments.

Dated this 19<sup>th</sup> day of February, 1988.

HOLME ROBERTS & OWEN  
A. Edgar Benton  
John Leonard Watson

  
Attorneys for Cotter Corporation  
1700 Broadway, Suite 1800  
Denver, Colorado 80290  
(303) 861-7000



CERTIFICATE OF SERVICE

I HEREBY CERTIFY that on this <sup>B</sup> 19 day of February, 1988, a true and correct copy of the foregoing COTTER CORPORATION'S RESPONSES TO PUBLIC COMMENTS was hand delivered addressed to the following:

Carolyn L. Buchholz, Esq.  
CERCLA Litigation Section  
Office of the Attorney General  
1560 Broadway, Suite 250  
Denver, Colorado 80202

Benny A. Sneyd

**ATTACHMENT A TO  
COTTER CORPORATION'S RESPONSES TO PUBLIC COMMENTS**

## RESPONSE TO EPA'S COMMENTS ON THE RAP

### Section 4: Main and Secondary Impoundments<sup>1</sup>

The EPA comments at page 13 that section 4 of the RAP does not contain performance standards that will be used to determine when remediation is complete.

It is true that Section 4 of the RAP does not contain separate performance standards which, when met, will indicate that the remediation of the main and secondary impoundments is complete. The approach of not setting performance standards for each individual remedial action was adopted because the remedial activities are interdependent components of a comprehensive remedial program. The performance standards for the entire ground water program are contained in Section 14 of the RAP. These performance standards are clearly referenced in Section 4 on pages 36 and 37:

The purpose of these remedial activities is to collect leakage, if any, from the main and secondary impoundments, to intercept, to the maximum extent reasonably achievable, ground water flow moving from the Old Tailings Pond Area to the area beneath the new impoundments, and in conjunction with the other ground water remedial activities to achieve the ground water quality objectives stated in Section 14. (Emphasis added.)

Several additional factors make the establishment of performance standards specific to this remedial action impractical. Alkaline tailings from the old mill are contained in both the main and secondary impoundments, and the

---

<sup>1</sup> References in the Section Headings of these responses are to the applicable sections of the RAP.

secondary impoundment was constructed over old ponds 9 and 10, which also contained, among other constituents, alkaline tailings. Therefore, it is not feasible to design a ground water monitoring program to be conducted in the vicinity of the impoundments which could determine whether the impoundments are leaking. Additionally, the use of a tracer program to determine whether the impoundments are leaking has been investigated, in 1980 and 1981, and found to be not completely reliable and prohibitively expensive (several times the cost of the entire clean-up program). This information has been in the public domain since 1981. Due to these factors, it is not possible to determine whether leakage is occurring, and if it is occurring, what the leakage rate is.

Accordingly, it is not appropriate to base the duration of this remedial activity on the achievement of some performance standard which would indicate whether leakage, if any, had ceased. Therefore, a more conservative approach was taken. The remediation will continue as long as the impoundments are operated. At impoundment closure, the impoundments will be dewatered and capped. This will reduce the hydraulic head in the impoundments.

Section 4.1, p. 36

The EPA comments at page 13 that:

If the State suspects that the Hypalon liner is leaking, then the main and secondary impoundments should be considered a source of contamination, and not an area of safe, permanent storage and disposal.

There are three points at issue here: 1) an unproven suspicion is not grounds for making a determination about whether a facility actually is a source of contamination, 2) despite the fact that leakage has not been proven, the impoundments are treated in the RAP as sources of contamination, and a line of withdrawal wells to capture leakage, if any, will be installed, and 3) the EPA appears to be holding Cotter to a standard different than that applied at other facilities. The EPA's double standard is exhibited when one compares the EPA's comments on the Cotter Settlement with recent regulations that propose to impose certain leak detection requirements on RCRA land disposal units. The preamble to the EPA regulations contains the following statements:

The EPA believes that it is critical that the owner or operator promptly initiate response activities when leakage above a certain rate is detected." (Emphasis added);

and

The Agency is not proposing to require other existing land disposal units to adopt such double-liner requirements because in order to meet these requirements, an existing unit would need to excavate or remove all hazardous wastes. Besides being impractical, the removal of hazardous wastes could also pose a substantial environmental threat;

and

"Although a liner is a barrier to prevent migration of liquids out of the [waste disposal] unit, no liner can be expected to remain impervious forever." (52 FR 20221).

The EPA seems to be holding the Cotter RAP to a standard different than that it applies to the facilities over which it has jurisdiction, implying that the Cotter main and secondary impoundments are not an area of safe, permanent disposal unless the liners can remain impervious forever.

Although it must be very satisfying for the EPA to step in to a complex situation at a very late date and attempt to impose an absolute standard that liners should not ever leak, their attempt in this instance is flawed. Physical laws prevent enforcement of such standards and the EPA regulatory statements cited above acknowledge that the important issue is not whether leakage exists, but whether leakage above a certain rate is detected. The reality of the situation is much more complex than the simplistic argument that if the impoundments might be leaking, they should not be considered areas of safe, permanent disposal.

Section 4.2, p. 37

The EPA comments at page 13 that Section 4.2 of the RAP should include a criterion for establishing withdrawal well spacing. They suggest that the wells should have sufficient overlap of their cone of depression such that all leakage would be intercepted. The RAP contains such a criterion on page 37:

The piezometer design and well operation shall be sufficient to demonstrate that, to the maximum extent reasonably achievable, a gradient exists to the withdrawal wells at all locations between each pair of withdrawal wells.

On page 13 of the comments, the EPA states that:

The design of the extraction system is dependent on information gathered from piezometer monitoring, yet the proposed plan appears to involve concurrent piezometer monitoring and extraction well pump tests.

The EPA has misread the RAP. There is no proposed plan contained in the RAP which specifies either extraction well pump tests or piezometer monitoring as a part of the design of the withdrawal well system. Cotter is required to

submit such a plan for the design of the withdrawal well system subsequent to the entry of the Consent Decree by the Court. In general, the RAP does not set forth the design plan for remedial action programs; rather, it establishes performance criteria and requires that plans which are designed to achieve the performance criteria be submitted for State approval. As a part of the settlement, Cotter will deposit sufficient funds with the State to provide the technical expertise needed by the State to evaluate these plans.

Section 4.2(3), p. 38

The EPA comments at page 14 that, if the piezometer network indicates that the drawdown between extraction wells is not being maintained, the pump rates should be adjusted (increased) to compensate for such conditions. The RAP addresses this issue on page 38:

If the piezometer network indicates that the drawdown is not being maintained, Cotter will notify the State, and then conduct an analysis to determine whether a transient condition caused by, among other things, unusual precipitation, infiltration, etc., has changed gradient conditions. If it is determined that a transient condition does not exist, Cotter shall modify the withdrawal well system pursuant to the schedule set forth in the transient condition report. (Emphasis added.)

Quite obviously, increasing the pump rates is the first method Cotter will consider in determining how to modify the system. However, it is not the only means which should be considered. It may be necessary to drill new wells, or make other more extensive modifications to the system. The RAP authorizes such modifications, should they be necessary to maintain drawdown.

Section 4.2(4), p. 39

The EPA comments at page 14 that, it is unclear how Cotter will be able to prepare an adequate withdrawal well system without actual permeability and water level data.

Cotter and the State are aware the EPA had limited time in which to prepare their comments on the RAP, but EPA would have benefited from even a cursory examination of the extensive ground water hydrology data base, which is, and has been for many years, public information. Cotter takes this opportunity to inform the EPA that such data do exist, and will be used in the design of the system. Additional data will also be collected.

It should also be noted here, as is explained in the State's responses to the EPA comments, that the State advised EPA of settlement negotiations in this action, consulted with the EPA concerning settlement and the Remedial Action Plan ("RAP") and provided the EPA an opportunity to review drafts of the proposed Consent Decree and RAP. In addition, during the course of settlement negotiations, the State met with EPA on several occasions to consult with it regarding NCP and CERCLA consistency. At no time did EPA advise the State, orally or in writing, that any aspect of the proposed settlement was inconsistent with the NCP or CERCLA.



The EPA comments at page 14 that:

The criteria for shutting down the withdrawal wells is (sic) inadequate because the removal of free standing water still leaves a large volume of water in the tailings, which could move into the ground water system. Abandonment criteria should include some evidence of dewatering of the pile.

The dewatering of the impoundments is a reclamation issue, and as such, is not the subject of the CERCLA litigation. Reclamation issues will be addressed by the Colorado Department of Health in the state mill relicensing proceedings.

In addition, at Paragraph 8 of Section 14.1.5, the RAP states:

If an exceedance of concentration limits occurs after RAP ground water remedial activities are completed, a corrective action program pursuant to 40 C.F.R. 192.33 shall be implemented. This requirement is adequate to assure ground water protection in the period following completion of the RAP.

Section 4.2(5), p. 39

In reference to the use of the water pumped from the withdrawal wells, the EPA comments at page 14 that criteria which would be applied by the State in approving use of this water are not described in this Section.

The RAP does contain the criteria which will be applied by the State in approving use of such water. The RAP states in Section 4:

The water pumped from the withdrawal wells shall not be, unless approved by the State, (1) reinjected into the ground water down-gradient of the SCS hydrologic barrier, or (2) released to the surface. The basis for State approval of such use shall be a demonstration that such use or release shall meet the requirements set forth in Section 3.1.3.

Paraphrased, Section 3.1.3 requires that, waters which are released meet the provisions of the Colorado Water Quality Control Act and all regulations promulgated thereunder. Waters may not be released if to do so would be incompatible with Sections of the RAP concerning Site Adjacent Soils (Section 24), Willow Lakes (Section 26), Ephemeral Streams and Fremont Ditch (Section 27), Pathway Management (Section 29), and the Arkansas River (Section 30). Additionally, such releases must not prevent the achievement of the ground water quality objectives stated in Section 14.1.3 of the RAP.

Contrary to the EPA's characterization of Section 4 as not containing approval criteria, the RAP provides a comprehensive set of requirements which consider the impacts of such releases on the total environment which could be affected by the releases. This approach is far more flexible and inclusive than one which states that water may be released if it contains less than a specific concentration of any given constituent.

#### Section 5: Secondary Impoundment

The EPA comments at page 14 that:

The cleanup standards to be met through these remedial activities are not clearly identified in the RAP. This section does, however, identify RCRA surface impoundment requirements (40 CFR 264.221) as applicable to construction of the new water distribution pond.

The EPA obviously has Section 5 of the RAP (which concerns the evaporation pond which is a modification to the existing secondary impoundment) confused with Section 6 (which concerns the Water Distribution Pond, a facility which

has not yet been built). The RCRA surface impoundment reference is not contained in Section 5 of the RAP; it is found only in Section 6. As is stated in the RAP at page 46, the purpose for construction of the evaporation pond on the secondary impoundment is twofold: to manage water on the mill site, and to control particulate emissions from the surface of the secondary impoundment.

There are no "clean-up" standards to be met through these remedial activities because:

- ° The first purpose of the remedial activity (water management) is not a clean-up activity per se. Rather, the construction of the evaporation pond on the secondary impoundment will enable several other remedial facilities to function more efficiently. The overall cleanup standard for the ground water remedial action system as a whole is that contained in Section 14; and
- ° The second purpose of the remedial activity (reduction in particulate emissions) is merely an improvement in an existing facility which currently complies with applicable standards. The results of air quality monitoring conducted at the mill, which are available in public documents such as the mill license renewal application and the annual reports, indicate that there have been no violations of particulate emissions standards.

Section 5.2(2), p. 47

The EPA comments at page 15 that, the rationale for furrowing the accumulated tailings for dust control is not presented. The rationale for furrowing is as follows. Furrowing, when perpendicular to the prevailing wind direction, increases surface roughness and decreases the volume of wind-blown soil loss or particulate emissions. (Woodruff and Siddeway, U.S.D.A., 1965).

The EPA comments at page 15 that, the technical procedure for raising the elevation of the existing Hypalon liner is not discussed. The comments further state that, the procedure needs to be evaluated to assure that the integrity of the liner is not compromised. To assure that the technical procedure can be conducted without compromising the integrity of the existing liner is precisely the reason that the RAP contains the requirement that the plan for the construction of the evaporation pond on the secondary impoundment be submitted for State approval. This requirement is contained in paragraph 2 of Section 5.3 of the RAP at page 48.

#### Section 6: Water Distribution Pond

The EPA comments at page 15 that, the new pond is intended to provide storage capacity for water extracted during flushing operations. While this is one of the potential uses for the water distribution pond, it has several other uses, which are listed in the RAP at page 51:

This pond will function as a surge pond to control the inflows and outflows of water from the SCS hydrologic barrier, withdrawal wells, flushing extraction wells, and/or site runoff.

The EPA's review of Section 6 evidently has been hampered by their failure to consult the existing design document for the water distribution pond, a public document which was submitted to the State of Colorado on June 29, 1984, and was hand-delivered to the Region VIII office of the EPA that same day. In light of the availability of the complete design and construction specifications, all of the EPA's comments concerning the inadequacy of the information

presented in the RAP are without foundation, and will not be addressed here individually. One EPA comment, however, requires response. At page 16, the EPA comments that,

The use of onsite clay, which may be contaminated, should not be allowed. Past experience indicates that an offsite clay source will be needed.

By this single statement, the EPA appears to be ruling out the use of any clay found on the mill site on the grounds that it "may be" contaminated. The approach which has been adopted in the RAP is to require testing of the clay prior to its use. This approach is more cost-effective than a wholesale rejection of clay material on the basis of suspicion.

The EPA comments at page 16 that:

Improperly installed liners in the existing main and secondary impoundments may be responsible for their suspected lack of integrity. Future impoundment liners must be installed properly.

As to the proper installation of future liners, this is the reason that the RAP at page 52 requires that a QA/QC plan for the construction of the water distribution pond be submitted prior to its construction. It will be the responsibility of the Cotter construction quality assurance program to assure the quality of the liner installation. The State will provide oversight in the person of the onsite coordinator.

#### Section 7: Neutralization of the Primary Impoundment

The EPA comments at page 16 that the RAP fails to relate the pH standard of 4.2 to the effectiveness of the clay liner. The original rationale for this pH

standard of 4.2, as explained by the license condition document referenced in the RAP, was to maintain the dissolved solids in the tailings liquor at concentrations which would not significantly reduce the rate of evaporation from the surface of the tailings pond. Pan evaporation tests conducted by Cotter indicate no difference between pH 2.3 pond liquid and fresh water evaporation rates.

Based on a number of studies primarily conducted by the Batelle Pacific Northwest Laboratory, the scientific community has become aware of potential adverse impacts of low pH liquids on the permeability of certain clays. However, these adverse impacts cannot be expected to occur in all circumstances. Such variables as the carbonate content in the clay, and the chemical makeup of the low pH liquid may result in the clay liner actually becoming less permeable under certain circumstances. Therefore, as is stated in Section 7.1 of the RAP, the purpose of the remedial activities identified in Section 7 is to determine the actual impacts of the pH 2.3 tailings liquids from the main impoundment on the types of clays used to construct the impoundment.

If it is necessary and feasible to do so, the pH of the liquids will have to be raised. See RAP at Section 7.2. The EPA complains that the necessary and feasible standard is extremely nebulous, and the final decision maker is unspecified. This is not true. The decision maker is the State. See paragraph 3 of Section 7.3 of the RAP. Whether the neutralization is necessary will be determined based on an analysis of the ability of the liner

to raise the pH of the liquids passing through it, the volume of the liquid which could exhaust this ability to raise the pH of the liquids, and the changes in the clay liner permeability that reactions with the liquid might cause.

The EPA seems to be suggesting that, without benefit of information on the actual impact of the tailings liquids on the liner, a target pH for the liquids should be specified in the RAP. This approach is not reasonable. The approach which has been adopted in the RAP is a systematic approach which takes into account the complex, interdependent nature of the physical system. The appropriate pH cannot be specified until the impact of the liquids at various pHs is known.

Section 7.2, p. 55

Concerning the study regarding the pH of the liquids in the main impoundment, the EPA comments at page 16 that, "If a clay liner is anticipated to fail, an alternative, nonpermeable liner should be proposed." The agency is apparently confused regarding the facility addressed by this study. Construction of the primary impoundment, which is the subject of this study, was completed in 1979. It is a double-lined impoundment. The top liner is an impermeable synthetic liner, which is underlain by a clay liner. This clay liner is the subject of this study. It is far too late to propose a new liner design for the primary impoundment.

Finally, the design documents for this impoundment were made available to EPA and EPA commented on this project in 1978 and 1979.

Section 7.2(2), p. 56

The EPA comments at page 17 that, the conditions which necessitate neutralization and implementation of a plan to minimize acid-degradation of the existing clay liners are not presented. The RAP requires (Section 7.3, paragraph 3) that, if the neutralization of the impoundment is necessary, a plan to determine whether it is feasible will be submitted. Not all of the conditions which would necessitate neutralization are detailed in this Section. This is because the conditions cannot be enumerated in advance of the results of the neutralization study.

The EPA comments at page 17 that:

This section [7.2] should require the installation of several borings into the existing tailings (without penetrating the liner) to evaluate the in-situ Eh and pH conditions with respect to depth. The Eh and pH are probably variable throughout the system.

In view of the fact that, except for a few thousand square feet, the tailings are covered by water, it is not possible to conduct the drilling operation suggested by EPA. This comment further reflects the EPA's complete lack of familiarity with site conditions at and in the vicinity of Cotter's mill.



Section 8: Old Tailings Ponds Area

The EPA's comments at page 17 mirror their complaint from Section 4:

Performance standards for the flushing program are not identified; the RAP simply states (see page 67) that 'the design of the production scale flushing program shall provide for water treatment or a substantially equivalent water management system to reasonably maximize the dissolution and desorption of molybdenum and uranium.'

The EPA is directed to pages 60 and 61 of the RAP where the performance standards for the flushing program are set forth:

The purpose of these remedial activities is to identify the area where flushing will be conducted, to conduct a ground water flushing and surface soil removal program to effectively minimize the Old Tailings Ponds Area as a source of ground water impact, and in conjunction with other ground water remedial activities, to achieve the ground water quality objectives stated in Section 14. (Emphasis added.)

It is not possible at this date to establish numerical performance standards for concentrations of constituents in the ground water in the old tailings ponds area. The RAP requires that flushing of the old tailings pond area continue until design objectives for the flushing program are met. See Paragraph 4 of Section 8.2 of the RAP.

The EPA comments at page 17 that:

The Lincoln Park ground water quality objectives (proposed as 0.035 mg/l uranium and 0.1 mg/l molybdenum in the RAP) should be conformed to the Table A values for uranium and molybdenum in ground water at inactive uranium processing sites, adopted by the EPA in 52 Fed Reg. 36000, September 24, 1987.

There are two factual errors in the statement quoted above. First, the EPA regulations cited are not final regulations, but were first proposed on the date cited above. The public comment period was extended to January 29, 1988.

Second, the EPA states that the standards should be conformed to the inactive site standards. If this is a statement of the EPA's preference, Cotter will treat it as a preference. However, if the EPA believes that these standards are applicable to the Cotter site, they are wrong. The proposed regulations apply to ground water at inactive uranium processing sites, i.e., those regulated under Title I of the Uranium Mill Tailings Radiation Control Act (UMTRCA). The Cotter site is regulated under Title II of UMTRCA as an active site.

It is difficult to determine whether EPA's mischaracterization of the status and applicability of its own regulations should be viewed as a transparent attempt to use whatever means are available to criticize this RAP or as an indication of why EPA finds the interpretation of a document such as the RAP beyond the scope of its expertise.

Finally, the molybdenum standard in the RAP is identical to that in the proposed regulations. The uranium standard in the RAP is more stringent than that contained in the proposed regulations.

The EPA comments at page 18 that: "The RAP anticipates that the Lincoln Park ground water objectives won't be met for at least 16 years." The EPA has misread the RAP. Perhaps the source of their confusion is a design goal of the RAP stated in Paragraph 3. of Section 8.2:

3. Cotter shall design, construct, and operate a production injection and extraction ground water flushing program. The production flushing program shall include the following: . . . .

- c. An array of injection and withdrawal wells or trenches designed to flush water through the area identified pursuant to Paragraph 1, Section 8.2 at a rate sufficient to meet remediation goals within sixteen (16) years of the commencement of the flushing program.

The RAP requires that the flushing system be designed to flush the ground water on the site at a rate sufficient to meet the remediation goals within sixteen years. However, during the entire time that the Old Tailings Ponds Area flushing system is in place, the hydrologic barrier at the SCS dam (RAP Section 9) will also be in place. During part of this time, the SCS Dam to DeWeese Dye Ditch flushing program (RAP Section 12) will also be in place. Due to these remedial activities, the Lincoln Park ground water quality objectives are expected to be met within a relatively short period of time. The objective of the Old Tailings Ponds Area ground water flushing program is to assure that on-site cleanup is sufficient so that the Lincoln Park ground water quality objectives will continue to be met after operation of the SCS hydrologic barrier is discontinued.

The EPA comments at page 18 that, "The technical basis for the removal of the upper two feet of soil from the Old Tailings Ponds Area is not provided." The March, 1984, Cotter mill license renewal application indicates that, for seven key parameters tested, concentrations in the 0 to 1 foot sample interval are higher than the concentrations in the 2 to 3 foot sample interval, and all deeper intervals tested. See Appendix H, Soils Analyses, to the license renewal application. The conclusion to Appendix H states:

Significant contamination beneath the Cotter [old] tailing ponds [area] is almost completely confined to the top one foot of the subsoil. Concentrations of key parameters decrease rapidly with depth to apparent background concentrations at the deeper sample intervals. Evidence for the limited penetration of contaminants is derived from analysis of variance, distributions, cumulative frequency diagrams, and the t-test for difference in means.

The mill license renewal application is a publicly available document, which was filed with the Colorado Department of Health on March 29, 1984. The EPA reviewed a copy of this document in late 1984.

The EPA comments at page 18 that, "The RAP does not provide soils performance standards in describing this removal activity.". It is true that the RAP does not provide standards specific to the removal of the upper two feet of soil from the Old Tailings Ponds Area. This soil removal activity is an intermediate activity being undertaken prior to final site closure. At mill closure, this and all other areas on the mill site will be subject to the standards specified in Section 21 of the RAP, On-Site Soils.

Section 8.2(1a), p. 62

The EPA comments at page 18 that:

The location of all core and water samples to be used in developing the pilot-scale flushing program should be based on a valid geostatistical technique and presented for evaluation. Sample analyses should include all metals and radionuclides, not just molybdenum. The RAP should be modified to establish the criteria required to design an efficient pilot program.

Cotter is required to submit for State approval the plan for the design of the pilot scale flushing operation. As a part of the settlement of the lawsuit,

Cotter will pay \$1.2 million to the State for oversight of the RAP implementation. The purpose of this sum is stated in Appendix C to the Consent Decree:

(W)hich sum shall be used by the State to exercise its rights and obligations under the Consent Decree, including, but not limited to, reviewing Cotter's submissions under the RAP; overseeing the performance of the Work and retaining the necessary consultants.

It is not necessary to delay the cleanup at the site by amending the RAP at this time to incorporate EPA's suggested modifications. The State will maintain continuing oversight of RAP implementation.

Many of the remainder of EPA's comments concerning Section 8 are written in the same vein as the comment above. The two major complaints seem to be: 1) the flushing program should be designed differently, and 2) EPA would have the RAP specify the complete design for the flushing program, rather than having it be submitted for State approval in phases as is required by the RAP. In response, it is not constructive for the EPA to attempt to design the pilot flushing program, or to attempt to renegotiate the RAP at this time. Adequate funds have been provided for the State to obtain such technical input as is necessary.

The remainder of the specific responses provided to EPA's comments on Section 8 of the RAP will be limited to corrections of EPA's misinterpretations of the RAP.

Section 8.2(3B), p. 66

The EPA comments at page 20 that:

The rationale for monitoring the total dissolved solids (TDS) at the SCS barrier is not given. The standards proposed appear to have already been determined as 1.25 times the 567 mg/l as detected in 1985 and 1986 (i.e., 709 mg/l). This value far exceeds 400 mg/l, rendering the latter irrelevant. The significance of these values is not presented.

The TDS standard provided in this section does not apply at the SCS barrier. It applies at the Lincoln Park monitoring well. The significance to the 400 mg/l or 1.25 times background is that it is taken from the Colorado Basic Standards for Ground Water.

Section 8.2(3c), p. 67

The EPA comments at page 20 that the ground water flushing program should be designed to maximize the removal of all contaminants, including TCE. In response, TCE has not been found in the ground water on the mill site. The RI speculated that there might be TCE in the ground water, and mentioned that "this situation has been investigated by the U.S. Environmental Protection Agency." (RI at page 5-13 and 5-14). If the EPA has any evidence of TCE in ground water, it has not made these data available.

Section 8.2(3e), p. 67-68

The EPA comments at page 21 that:

The rationale for maintaining the water level in C piezometers at 0.2 ft higher than that in D piezometers is not presented. Supporting evidence indicating that this difference will be adequate to maintain the hydrologic barrier during maximum seasonal fluctuations needs to be presented. The magnitude of the gradient (0.2 ft) barely exceeds the precision of the piezometer surveyed elevation.

The EPA is confusing the characteristics of the ground water system in the area along the boundary of Sections 9 and 16 (where the hydraulic barrier and piezometers in lines C and D will be constructed) with the area in Lincoln Park in the vicinity of the DeWeese Dye Ditch. In the former, variability in hydraulic heads is primarily a function of local pumping and, to a lesser degree, response to rainfall events.

In the latter, the presence of the DeWeese Dye Ditch causes a strong seasonal fluctuation in hydraulic head.

EPA is confused on two additional points. First, the 0.2 foot head difference criterion is not the sole means by which it will be determined whether the hydraulic barrier is sufficient. The RAP requires that:

The piezometer design and well operation shall be sufficient to demonstrate that, to the maximum extent reasonably achievable, a gradient exists away from the 9/16 hydraulic barrier at all locations (RAP at page 68).

The State will have the opportunity to review the operational data on the system, and determine whether the hydraulic barrier is sufficient, during its

review of each annual report. [Note, also, that the EPA has mistakenly referred to the 0.2 foot head difference criterion as a "gradient". A gradient would be stated in feet of head drop per horizontal foot in the downgradient direction.]

The second point of confusion relates to the accuracy of the survey which will be conducted on the piezometers. EPA comments at page 21 that, "The magnitude of the gradient (0.2 ft.) barely exceeds the precision of the piezometer surveyed elevation.". As is specified in Section 3.2.1.4 of the RAP on page 23:

Elevations of well or piezometer measuring points shall be determined to the nearest 0.1 foot, except where hydraulic heads in piezometers are compared against each other as a performance criterion, measuring point elevations shall be determined to the nearest 0.01 foot.  
(Emphasis added.)

The piezometers described in the EPA comment, above, will be surveyed to the nearest 0.01 foot.

Section 8.2 (4a)(i), p.70

The EPA comments at page 21 that:

The State should be permitted to disagree with not only the model predictions, but with the assumptions made by the model and the input parameters used.

The State is provided numerous opportunities to disagree with the model assumptions and input parameters. The State may disagree with the model when (1) it is first proposed (pursuant to paragraph 2 of Section 8.3 of the RAP) as a component of the design plan for the pilot study, (2) when it is revised



and resubmitted (pursuant to paragraph 5 of Section 8.3 of the RAP) as a part of the plan for the production flushing phase, and (3) when it is reviewed as a component of each of the subsequent annual reports (required by paragraph 7 of Section 8.3 of the RAP) on the Old Tailings Pond Area flushing. These opportunities for State review will assure that, when the time comes for using the model to predict the concentrations at the Lincoln Park compliance monitoring well, its assumptions, input, calibration, and predictions have been thoroughly reviewed and agreed upon by Cotter and the State.

#### Section 9: Hydrologic Barrier at the SCS Dam

##### Section 9.2(1a), p. 80

With respect to the SCS hydrologic barrier, the EPA comments at page 22 that:

The construction material and design are not presented in the RAP. The total depth of the barrier is not described. The suitability and effectiveness of the proposed system are not addressed relative to site-specific criteria.

The design of the hydrologic barrier at the SCS dam is referenced rather than reproduced in its entirety in the RAP. The reference is contained in paragraph 1(a) of Section 9.2 of the RAP. The design was submitted to the Colorado Department of Health on June 29, 1984, and hand delivered to the U.S. EPA on the same day.

The EPA also comments at page 22 that:

The SCS dam, which is part of the barrier system, is known to transmit ground water under its structure. No provision for limiting underflow is presented for the barrier wall system. The effect of this system is not addressed anywhere in this section.

EPA must have been on vacation for the last four years. The sole purpose of the hydrologic barrier at the SCS dam is to limit the ground water transmitted beneath the SCS dam. EPA has had the design document in its possession for almost four years, and expressed its concerns in its comments on that document in 1984. The lack of institutional memory at the EPA is frightening.

The EPA further comments at page 23 that:

The temporary cessation of the SCS hydrologic barrier should not be made solely on the basis of the ground water model prediction. The compliance with ground water criteria objectives should be verified with monitoring well data prior to cessation of the barrier system.

The purpose of the temporary cessation of the barrier system is to test, using monitoring well data, whether the Lincoln Park ground water quality objectives will be met prior to permanent cessation of the barrier system. The only way to verify whether the objectives will be met with monitoring well data is to temporarily cease operation of the barrier.

Section 9.2(3), p. 88

The EPA comments at page 23 that:

The characteristics of the contaminants need to be defined. If organic compounds are present in the ground water, the clay used as a barrier may be adversely affected causing increased permeability. If organics are detectable, an alternative to clay construction materials will be required.

There are extensive data available on the characteristics of the ground water. The data have been sent to EPA monthly since 1981. There is no evidence of organic contamination in ground water on the mill site, unless the EPA has

some data which it has not made public. Notwithstanding these facts, it is technically irresponsible to say that, "If organics are detectable, an alternative to clay construction materials will be required.". Many organics are detectable at the part per trillion level. Such concentrations would not be expected to have any impact on the permeability of a compacted clay barrier.

The EPA comments at page 23 that:

No random soil should be used for construction of the low permeability zone associated with the barrier. Only clay capable of compaction to  $10^{-7}$  cm<sup>2</sup> should be used.

In response, first, the design of the barrier does not call for the use of random soils in the low permeability zone. Second, with respect to the criterion EPA has attempted to establish for the clay, the units EPA has selected (cm<sup>2</sup>) suggest that EPA is attempting to establish the specific or intrinsic permeability (k) of the clay. A permeability of  $10^{-7}$  cm<sup>2</sup> is that of a sand. Sand is a highly permeable material, and not suitable for the construction of a hydrologic barrier. This is only one example of why Cotter is particularly suspicious about the degree of care and technical expertise which EPA has brought to bear in preparing its comments.

Section 9.2(3), p. 88

The EPA comments at page 23 that:

The permanent cessation of the SCS hydrologic barrier should not be permitted until such a time as it can be proved that upgradient releases will never cause the Lincoln Park ground water quality objectives to be exceeded.

The EPA is again attempting to impose more stringent requirements on this facility than required by its own regulations, which regulations are incorporated into the RAP in Section 14.1.5. These EPA regulations do not require proof that ACLs will never be exceeded before remediation may cease.

#### Section 10: Northwest and Northeast Shallow Ground Water Pathways

The EPA comments at page 24 that:

The actions to be taken, should pathways be found, are not clearly developed. It appears that the RAP does not require that Cotter remediate any contamination found, but rather than it only stop further migration. The RAP does not clearly identify how a decision that remediation is required will be made, including who the decision maker will be.

The EPA is correct in stating that the actions to be taken, should pathways be found, are not clearly developed. This is because, in advance of even determining whether such pathways exist, it is premature to specify how they should be remediated. The existing water quality data base, which has extensive water quality monitoring data along the suspected northwest and northeast pathways, does not identify any pathways. The current ground water quality data base indicates that there is no contamination along these pathways. As noted in paragraph 5 of Section 10.2 (page 101), if significant contamination is found, Cotter is required to:

[C]onduct additional appropriate investigations, and design and submit a proposal and construction schedule for a remediation program to effectively minimize and mitigate the pathway(s) of ground water flow.

The EPA further comments that, the purpose of this remedial activity is to identify, if any, the northwest and northeast shallow ground water pathways,

and also comments that, the RI states that, the primary pathways of ground water flow are shallow pathways. The EPA continues at page 24:

The RAP proposes cessation of Class B (shallow) monitoring wells after the initial sampling phase; this is not justifiable.

The EPA has misunderstood the purpose of the Class A and Class B wells. The Class A wells are extremely high quality, very expensive, ground water quality monitoring wells equipped with dedicated pumps. They may be completed to any depth required by the nature of the investigation. There are several shallow Class A monitoring wells planned along both the northwest and northeast pathways. The Class B wells are constructed primarily for the purpose of determining water levels. These wells need no longer be monitored after the piezometric surface along the pathways is determined.

Section 10.2(3), p. 99

The EPA comments at page 24 that:

The analyses should include all metals and radionuclides, not just molybdenum.

The purpose of this investigation is to determine whether there is a pathway from the Cotter mill site to the northwest or to the northeast. More than ten years of hydrogeologic investigations conducted at the Cotter mill site have shown that molybdenum is an ideal tracer for the presence of a hydraulic connection between the old tailings ponds area and any other water body. This is true due to (1) the presence of molybdenum in high concentrations on the mill site, (2) the mobility of molybdenum in ground water, and (3) the low

background concentration of molybdenum in the vicinity of the mill. As a part of the routine monitoring program set forth in Chapter 15 of the RAP, ground water in some of the Class A wells along the suspected northeast and northwest pathways will be tested for additional constituents. However, since the purpose of the northeast and northwest pathway investigation is to determine whether such pathways exist, it is not reasonable to use any other constituent to make this determination.

Section 10.2(4), p. 100

The EPA comments at page 24 that:

A search for a hydrologic divide is not the only purpose of these analyses. If any ground water flow path is detected, regardless of a divide, the contaminant migration potential should be evaluated.

There are two separate cases identified in Section 10.2 of the RAP. If there is a hydrologic divide, it is assumed that there is no shallow flow path, and the ground water quality data will be monitored to determine that the molybdenum concentration is not increasing. This investigation is described in paragraph 3 of Section 10.2. If there is no hydrologic divide, then the data will be compared against background range to determine whether remediation is required. Thus, as the EPA wishes, if there is any ground water flow path detected, the contaminant migration potential will be evaluated.

## Section 11: Wolf Park Mine Shaft

The EPA comments at page 25 that:

This section of the RAP appears to contain the only reference to possible deep ground water contamination. EPA has long been concerned that such contamination might exist, and has commented on this question several times.

The EPA has not only commented on this question several times, it has spent taxpayer dollars investigating this question. These are the conclusions of the most recent investigations funded by EPA:

Based on these observations of the data, it is concluded that the "Deep Path" is not a significant pathway of contamination in Lincoln Park. (Wilder, et al, 1983);

and

The "deep migration path" probably is less important than the "shallow migration path" in providing a route for the migration of raffinate-affected water. Three interpretations presented in this report support this hypothesis. First, none of the samples from deep wells contained significantly large concentrations of raffinate components.... Second, beds of the Vermejo Formation penetrated by the test wells do not seem to be very transmissive.... Third, the major-ion composition of water from the study area does not indicate substantial flow from the Vermejo Formation from the alluvial aquifer in Lincoln Park. (USGS, 1987).

Thus far, several hundred thousand dollars have been spent investigating the so-called "deep migration path". However, no evidence of its existence has been found. Due to the depth at which the investigations would have to be conducted, an additional several hundred thousand dollars could be spent attempting to prove that the deep path does not exist. The investigations would have to determine the actual pathway which would be taken by the raffinate-affected water, and the rate of migration. This would require a group of wells over 1000 feet deep.

This investigation is not justifiable because it can easily be demonstrated that, by the time water from any deep path reached a location where it could come into contact with the public or the surface environment, the concentrations of any raffinate-affected waters in the deep path would have attenuated to the point where any potential risk from the water to human health or the environment would be vanishingly small.

The RAP will determine whether there is an open pathway down the Wolf Park Mine shaft. If so, it will be remediated. If not, it is of only academic interest to continue to study a pathway which is of little significance.

#### Section 12: SCS Dam to DeWeese Dye Ditch

The EPA comments at page 27 that:

Once flushing operations at the OTP [Old Tailings Pond Area] and in the vicinity of the DeWeese Dye Ditch end, and "compliance" at the Lincoln Park Well is achieved, all remedial activities for off-site ground water remediation end. This approach is technically and legally inadequate. Cotter has closure and post closure obligations with respect to ground water compliance, and these requirements should be addressed in the RAP.

These closure and post-closure obligations are addressed in the RAP. The EPA is directed to Section 14.1.5 of the RAP, where its regulations on closure and post-closure are quoted. It is interesting that the EPA considers its own regulations technically and legally inadequate.



Section 12.2.1(1), p. 114

The EPA comments at page 27 that the source of the water to be used in the flushing of the ground water between the SCS dam and the DeWeese Dye Ditch is not defined.

Although the specific source of the water is not defined, the quality must be approved by the State (RAP paragraph 1 of Section 12.2.1). There are several excellent water quality sources available for this purpose. Selection of a water source is a commercial matter for Cotter, not EPA.

The EPA further comments at page 27 that:

This section of the RAP is confusing. It sets criteria for a rise in water level and then establishes another criteria (sic) for pumping rate (100 gpm). The RAP should define the basis for the maximum pumping rate of 100 gpm. The RAP does not propose an alternative method for maintaining the desired water level if the maximum pumping rate is inadequate.

As noted in several documents that have been in the public domain for several years (including the mill license renewal application which was reviewed by EPA in 1984), the amount of ground water which flowed beneath the dam prior to the start of pumping operations is estimated to be 80 to 90 gpm. If this pumping rate is inadequate to raise the ground water in the Sand Creek channel from the SCS Dam to the DeWeese Dye Ditch to an elevation at or above the water level elevations existing prior to the start of pumpback operations, no alternative method is available.

The EPA comments at page 27 that:

The travel time of ground water to the compliance point should be estimated by injecting a tracer into the ground water.

The transit time from the SCS barrier to the DeWeese Dye Ditch will be estimated by observing the concentrations at the Lincoln Park monitoring well after the installation of the barrier. The absence of flux from the barrier will be an effective tracer.

Section 12.2.2(1), p. 115

The EPA comments at page 28 that:

The plan does not specify the source of flushing water if the water behind the barrier does not meet water quality standards.

Section 12.2.2 of the RAP does not describe a flushing activity. It describes the means by which the performance of the entire ground water remedial action program will be tested prior to the permanent cessation of operations at the SCS barrier. This is clearly stated in the first paragraph of the section. All of the rest of EPA's comments in this paragraph are not responded to here because they are based on the mistaken premise that this paragraph deals with the Dam to Ditch flushing. The Dam to Ditch flushing program described in Section 12.1.2 is a remedial activity. The activity described in the referenced paragraph will be performed near the end of the remedial action program to test whether the remediation conducted upgradient of the SCS dam has been sufficient to allow permanent cessation of operations.

### Section 13: Lincoln Park Water Use

The EPA comments at page 28 that:

After Cotter completes its water-use survey (designed to identify where and how existing shallow ground water wells are being used), they are to "propose a discussion" with each person whose property was sampled. No explanation is provided as to the purpose of such discussions.

The pertinent paragraph of the RAP states:

Following the survey, Cotter shall report the survey and sample results to the State and the Health Risk Assessment Panel, and on the basis of guidance from the Health Risk Assessment Panel, propose a discussion with each person from whose property a sample was collected. (Section 13.2).

The purpose of the discussions will be to convey information to the property owner -- whatever information the Health Risk Assessment Panel determines is appropriate, based on water uses and water quality.

The EPA comments on page 29 that:

Finally, Cotter is obligated to pay the incremental costs... resulting from the replacement of ground water supplies. Residents of Lincoln Park should not have to pay for replacement of ground water contaminated by Cotter; under CERCLA, Cotter is obligated to pay the full costs of any response actions required (see 42 U.S.C. section 9607(a)(4)).

Cotter's commitment to pay for any hookups, and the incremental costs of using city water does constitute the full cost of any response actions. Individuals will be paying no more for their water than they paid prior to being hooked up. For example, assume a resident was previously using well water to water a garden, and the cost to the resident of the well water was \$15 per month, further assume that the cost to the resident of using city water for the same

purpose will be \$17 per month. Cotter will pay for any required hookup and pay the resident the \$2 per month differential. Cotter is not obligated under CERCLA to pay residents the \$15 per month they would be spending in any case.

Section 14: Ground Water Compliance

The EPA comments at page 30 that:

The RAP contemplates that remedial activities designed to obtain the ground water compliance standards will not begin for 20-30 years, or about plant closure.

The EPA is mistaken, once again. The remedial activities contemplated for the site are those described in the RAP, and are designed to be completed by plant closure.

On the subject of ACLs (Alternate Concentration Limits established pursuant to 40 CFR 192), it is not necessary to quote the EPA's entire line of reasoning, but the EPA authors seem to think that if the EPA adopts applicable or relevant and appropriate standards, ACLs will not be allowed. This section appears to have been written by someone completely new to the ACL setting process, and to have been released without appropriate review by knowledgeable EPA management.

EPA's own regulations at 40 CFR 192 specify three methods for achieving compliance with the ground water protection standards. At the point of

compliance, ground water quality must be either: 1) the Table values, 2) background, or 3) an ACL. ACLs are to be set provided that the constituent will not pose a substantial present or potential hazard to human health or the environment, as long as the concentration limit is not exceeded.

The cleanup on the Cotter site cannot meet either the Table values or background. ACLs will clearly be required.

Section 14.1.2, p. 129

The EPA comments at page 30 that:

The rationale for only setting ACLs for molybdenum and uranium is not presented.

As is described in paragraphs 3 and 7 of 14.1.5 of the RAP, ACLs for any constituent will be set according to applicable regulations. The paragraph to which EPA is referring above relates to the concentration objectives for ground water quality which have been established for uranium and molybdenum at the Lincoln Park monitoring well. These objectives have been established only for uranium and molybdenum because only these constituents are present in ground waters in Lincoln Park in excess of water quality standards or guidance, as the EPA reviewer easily could have determined from even a cursory look at the data available to EPA for many years.

Section 14.1.4.1(2a), p. 130

The EPA comments at page 31 that:

The RAP states that only the flux of molybdenum and uranium will be used to determine transit time. Other metals (such as lead and selenium) should also be used to assure that remediation has been effective.

As explained above, molybdenum and uranium are the only constituents which exceed water quality standards in Lincoln Park. With respect to the EPA's specific suggestions of using selenium and lead to determine that remediation has been effective, these constituents are particularly ill-suited to this purpose. As EPA should be well aware, the natural background concentrations of selenium are quite high, and as such, selenium concentrations in Lincoln Park cannot be used as an indicator that remediation is complete. The concentration of lead in the Old Tailings Ponds Area is the same as that in Lincoln Park, not detectable.

Section 15: Ground Water Monitoring

Section 15.1(3), pp. 148-155

The EPA comments at page 33 that:

The monitoring schedule should include analysis for all elements and radionuclides.

This commentary is another example of the ill-informed, mindless, petulant and punitive approach taken by EPA toward this entire RAP and the underlying issues of risk and endangerment at the Lincoln Park site.

First, all elements and radionuclides of any possible real concern will be monitored on a routine basis. The elements to be monitored are listed on the last page of Table 15-1. Second, eight years of extensive monitoring have failed to show any justification for continuing frequent analyses of any of the radionuclides and many of the metals. Accordingly, such analyses are required on a lesser frequency, and at fewer locations than the parameters which provide useful information.

Section 16, p. 155

The EPA comments at page 33 that:

The soils remediation proposed for these two waste management units and two source locations should be done pursuant to RCRA and SMCRA ARARs. No standards have been identified, however.

Remedial activities to reduce airborne dispersion of particulates (e.g., impoundment flooding) may enhance ground water contaminant migration by the production of leachate that can migrate into the ground water system.

The author of EPA's comments at page 33 is clearly unfamiliar with the Cotter site in view of the fact that only one waste management unit is addressed in Section 16 (i.e., Main Impoundment). As a result of milling operations and in the interest of providing alternative retention space for some ground water remediation pumpback waters, the main impoundment now contains and will continue to contain a large volume of water. This flooded condition serves the ancillary functions of tailings beach minimization and dust control. (See also Cotter responses to EPA comments regarding RAP Sections 4, 5, 7 and 8.)

Regarding applicable standards, these have been cited in Section XXIV of the Consent Decree.

EPA's inference is that it would prefer that Cotter stop operating the main impoundment. If this is the case, EPA's Regional Administrator should issue, right now, a preliminary finding to that effect under 40 CFR 61 so that Cotter can stop investing financial and human resources trying to maintain a going business in the State of Colorado.

Section 18.2(2), pp. 163

The EPA comments at page 34 that:

Wetting the ore pile may create excess runoff and subsequent surface water and ground water contamination. The adequacy of the clay pad under the ore stockpile to contain runoff should be evaluated prior to wetting.

Wetting the ore pile will not create excess runoff and subsequent surface water and ground water contamination. This is due to the clay content of the soils of the ore stockpile locations and the runoff control berms incorporated into the design of this runoff control facility. This design was described in a document provided to the State and EPA on June 29, 1984. The State and Cotter have agreed that the judicious application of water on ore stockpiles in order to control dusting will not result in runoff impacts. This agreement is supported by the RAP language at Section 18.2(2) lines 4 and 5.



As is noted in the June 29, 1984, design document, the adequacy of the clay under the stockpile location will be determined during construction. These specifications were filed by Cotter with the State and EPA on June 29, 1984.

### Section 21: Onsite Soils

The EPA comments at page 34 that:

As discussed above, APARs for soils remediation (especially capping and revegetation) include RCRA and SMCRA. No standards for soils remediation are identified, however, and the extent of remediation is to be identified in future.

Standards for the remediation of onsite soils are specified in the RAP at Sections 21.2.3(c) and 21.2.3(d).

### Section 22: Roads

The EPA comments at page 34 that:

The plan to water roads to weaken the air migration pathway may actually enhance surface water and ground water contaminant migration. A detailed study needs to be performed to identify the effect of road watering on water transport mechanisms.

A detailed study to identify the effect of road watering on water transport mechanisms is not necessary. This is a standard dust control practice at many industrial facilities, and, because of the minimal amount of water applied to road surfaces and totally lost to evaporation, does not represent a source of ground water recharge.

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Section 23: Air Monitoring

The EPA comments at pages 34-35 that:

The Clean Air Act, RCRA and the Atomic Energy Act are potential ARARs for air emissions from the site. No standards are identified, however, and no remediation is proposed.

See Section XXIV of the Consent Decree regarding these ARARs. It should be noted, however, that particulate standards are enforced through the application of the Rules and Regulations Pertaining To Radiation Control For The State Of Colorado.

Moreover, remediation of potential sources of airborne particulate will result by implementing RAP Sections 5, 16, 17, 18, 20, 21, 22, 24, and 29. Section 23 of the RAP is to particulate remediation what Sections 14 and 15 are to ground water.

Section 23, p. 184

The EPA comments at page 35 that:

The data from the existing air monitoring system should be used to locate unaffected areas from which to collect background samples.

Existing air monitoring data have been evaluated with respect to the location of background sampling locations. Two locations depicted on Figure 23-1 of the RAP serve as background locations, i.e., the location at the boundary of

Sections 17 and 18, west of the mill, and the location in Canon City in Section 26. These sampling locations comport with the requirements for control sampling locations outlined in USNRC Regulatory Guide 4.14, "Radio-logical Effluent And Environmental Monitoring At Uranium Mills".

Section 24: Site Adjacent Soil

No comment necessary.

Section 25: Lincoln Park Soils, etc.

No comment necessary.

Section 26.2 (1), p. 206

The EPA comments at page 35 that:

The number and locations of the samples to be used in this study need to be defined. The specific type of biota should also be defined.

The number of and locations of samples to be collected for the purposes of the Willow Lakes study will be defined as specified in Section 26.2.1(a). The State will review the plan [Section 26.4.(2)] and approve or disapprove it prior to the initiation of sampling efforts. It is through this process that the adequacy of Cotter's study plan will be insured.

Unless EPA has some actual field data which it has not made public, the specific types of biota present are not known at this time. Accordingly, these will be identified during the course of the study through the sampling described in the State approved plan.

Section 27.2, p. 209

The EPA comments at page 36 that:

If the removal of any contaminated soil is required, a detailed plan will need to be submitted for evaluation. The outline presented in the RAP is not adequate to include all possibilities that may be encountered as a result of this study.

The outline presented in the RAP is not intended to be a detailed study protocol. It is prescriptive as to the monitoring concept expected by the State, but it is Cotter's task to prepare a detailed plan pursuant to Section 27.2(1)(a). In turn, it is the State's responsibility to determine the adequacy of Cotter's sampling plan [Section 27.4(2)].

Section 28: Perennial Streams

The EPA comments at page 36 that:

Lincoln Park residents have commented that high-level radioactive wastes (resulting from transport and disposal of Manhattan Project wastes) may be present in the vicinity of Lincoln Park. This concern should be addressed in the RAP.

The studies and resulting remediation of the Willow and Sand Creek drainages are not scheduled to be undertaken until mill closure. No interim actions are proposed. If health or environmental risks are present from contamination at these locations, these risks will therefore remain for at least the next 20 years.

EPA's comment regarding the presence of high-level radioactive wastes demonstrates complete ignorance about site conditions. There are no high-level radioactive wastes at the Cotter site. The constituent which indicates the presence of certain United States Atomic Energy Commission wastes is natural Th-230, which is the naturally occurring part of nature's U-238 decay chain. This radionuclide is addressed in the pathway management section of the RAP (Section 29). Ground water samples also will be analyzed for Th-230 (Section 15).

To the best of Cotter's knowledge, unless EPA has real evidence to the contrary, any connection between those U.S. A.E.C. wastes and any activities of the U.S. Army Corps of Engineers' Manhattan Engineering District conducted during and after World War II is based on hearsay.

EPA should note that concerning the upstream watershed, i.e., ephemeral streams, remediation will be initiated pursuant to Sections 27 and 29 well in advance of mill closure. In view of the fact that the aquatic population in the Arkansas River near Canon City sustains reproduction, and the river water quality complies with all applicable aquatic life standards, the quality of perennial stream sediment does not represent a significant concern.

Section 29: Pathway Management

The EPA comments at pages 36-37 that:

This section addresses the potential for contamination to the Arkansas River due to runoff over contaminated ephemeral streams. The RAP requires Cotter to perform "sub-basin" studies at a rate of two per year, to fully characterize the extent of contamination that may be present. Because the number of sub-basins is not identified, it is not possible to determine when these activities are to be complete. Once the studies are completed, Cotter is to remediate by (at its discretion) either removing the contaminated soils, or through construction of site-specific silt fences. Neither action levels nor cleanup standards are identified.

The number of sub-basin drainages is depicted on Figure 1-2 of the RAP.

Cleanup standards for these drainages are specified in Sections 29.2(3)(k)(i), 29.2(3)(k)(ii) and 29.2(2) of the RAP.

Section 29.2(3), p. 224

The EPA comments at page 37 that:

Detailed plans (including construction specifications and site-specific information) should be submitted for review prior to construction of the silt fence.

Construction specifications for silt fences (Section 29.2(3)(c) of the RAP) and site locations (Figure 1-2) are contained in the RAP.

## Section 30: Arkansas River

The EPA comments at page 37 that:

. . . . [The constituents of concern for the Arkansas River are not identified in the RAP, and the scope of study is limited to testing the effectiveness of Cotter's remediation activities, even though the extent of contamination is not presently known.] . . . Remediation is not proposed at any of these three locations.

Again, EPA misunderstands; it is not the purpose of the Arkansas River study to conduct remedial activities. Its purpose is to determine the adequacy of Cotter's river monitoring program with regard to its ability to measure the effectiveness of remedial activities. Once again, the State will review and approve or disapprove of Cotter's study plan (Section 30.4(2) of the RAP) prior to initiating the study. It will be this review process that insures the adequacy of the study scope.

## Section 32: Health Risk Assessment Panel

### 32.1 Introduction

The EPA comments at pages 38-39 that the RAP fails to comply with the requirements set forth in 40 CFR 300.68(e)(1) and (2) because the RAP states "The present data are insufficient to determine if there is an effect on human health.". This statement in the RAP is not intended, however, to suggest that there is no information which allows an evaluation of the scope and extent of potential environmental or human health impacts associated with the Cotter

mill. It merely indicates that there are some aspects of the exposure pathways that need further investigation. As noted below, a significant data base has been generated by Cotter, and has been used by the State, which does permit an evaluation of most of the impacts associated with the mill site.

As summarized below, the RAP does comply with the cited provisions of the National Contingency Plan (NCP).

- a) Based on the State's ongoing familiarity with site conditions due to its longstanding regulatory responsibilities for the site, initial remedial measures, as anticipated by 40 CFR 300.68 (e)(1), are not required. These measures were conducted under Cotter's radioactive materials license in 1981 through 1983 when Cotter moved approximately 2.7 million tons of tailings and some underlying soil from the unlined ponds used from 1958 to 1979 (i.e., all of the tailings generated by the old mill, the source term for ground water quality impacts). These tailings were isolated in the double-lined secondary impoundment. Furthermore, initial remedial measures are not necessary because none of the conditions set forth in Section 300.68(e)(1)(i)-(vii) are present at or near the site. These circumstances preclude the need for a risk assessment.
  
- b) As more fully discussed below, the endangerment assessment described in 40 CFR 300.68(e)(2) has been virtually completed. This was accomplished by virtue of the significant data base generated by



Cotter over the last ten years and by the Lincoln Park well use survey conducted by the U.S. Geological Survey in 1983. Data presented in Cotter's Environmental Report, dated September, 1977, which was prepared in support of new mill construction and license renewal, and in the March 29, 1984, license renewal application, have identified the population at risk, have described the amount and form of the substances present, the guidelines for acceptable concentrations of these substances have been properly referenced and applied, the hydrogeological and climatic conditions have been thoroughly evaluated, the extent of migration has been measured, various remedial measures used elsewhere have been considered, and the environmental effects and welfare concerns have been determined.

Section 32 of the RAP requires the assessment of the eight topics listed below. These topics will be evaluated either for the purpose of updating the status of previously evaluated information, i.e., the Lincoln Park water use survey, or for the purpose of evaluating a subset of the population at risk, i.e., the evaluation of fruits and vegetables or the evaluation of local dairies. The topics to be assessed are:

1. Consumption of impacted ground water;
2. Consumption of impacted surface water;
3. Exposure to impacted soils and sediments;
4. Inhalation of radon gas or impacted airborne dust;
5. Consumption of fish from impacted surface water bodies;
6. Consumption of fruits and vegetables irrigated with impacted water;

7. Consumption of milk from cows that have consumed impacted water; and
8. Consumption of meat from livestock that have consumed impacted water or feed.

Because such an extensive data base does exist, arguably the scope of the risk assessment will be quite limited.

During settlement negotiations, it was Cotter's position that all monitoring data and water use information supported the premise that there are no human health or environmental impacts in Lincoln Park attributable to the mill. It was the State's position that additional studies were necessary to follow-up previous impact assessments. The foregoing eight topics were agreed to by the parties as a compromise during settlement negotiations to avoid a serious impasse. The health risk assessment panel's work will be undertaken concurrently with remedial activities to address the State's remaining concerns. The following section of Cotter's responses to EPA's comments on the RAP will address each RAP study topic in the context of what is or is not known about that topic.

### 32.2 Consumption of Ground Water

Since the mid-1950s, the Lincoln Park area has been connected to the Canon City water distribution system. As the area grew and as time passed, all but a very few residences were connected to that system. The water use patterns of Lincoln Park residents were documented in October, 1983, by a water use survey conducted by the U.S. Geological Survey. The results of that survey,

used in conjunction with the records of the Canon City Water Department, indicate that no more than five residences in the Lincoln Park area use ground water for drinking purposes; two of these residences are connected to the city water system, but prefer to drink their well water. The others are either in Lincoln Park or Brookside, depending upon how one decides where the boundary between these two communities is located. Regardless of the community in which these residences are located, the water quality of their wells is good. Fewer residents of the area at and near Brookside, (a small area located immediately adjacent to the east boundary of Lincoln Park), are connected to the city system. All of this information has been in the public domain, and available to EPA, since March 1984.

Referring to the extensive existing water quality and hydrology data base generated by Cotter during the last ten years, as verified by sampling and testing conducted by the State and the EPA, the ground water quality of all of Lincoln Park, as well as the Brookside area, is better than the EPA's National Primary Drinking Water Standards. The ground water quality of the entire Brookside area, as well as a large part of Lincoln Park is better than EPA's guidance levels specified for uranium and molybdenum.

### 32.3 Consumption of Surface Water

The intake for the Canon City water system is located approximately five miles upstream of the confluence of Sand Creek, the intermittent drainage which drains the mill site, and the Arkansas River. The water quality of the

Arkansas River near this location complies with EPA's Primary Drinking Water Standards, guidance levels for uranium and molybdenum, and the applicable Colorado Water Quality Control Commission stream segment standards.

The intake for the town of Florence is located approximately five miles downstream of the confluence of Sand Creek and the Arkansas river. The water quality of the Arkansas River near this location complies with EPA's Primary Drinking Water Standards, guidance levels for uranium and molybdenum, and the applicable Colorado Water Quality Control Commission stream segment standards.

#### 32.4 Exposure to Soils and Sediments

First, as noted in Section 5.0, below, at no time since Cotter began collecting air quality data have the ambient air quality standards for radon, particulate radionuclides or for total suspended particulate been violated, even at the mill site boundary. Presumably, when these air quality standards were established, it was recognized by the regulatory authorities that a certain fraction of the airborne particulates would settle out of the atmosphere to mix with the soils located near the facility generating this dust. Furthermore, as an underlying regulatory premise, it has been determined that a certain amount of particulate can enter the atmosphere and surrounding biosphere without causing adverse consequences; otherwise, the air quality standards would be set at zero. On the assumption that compliance with the ambient air quality standards also will insure that particulates settling out of the atmosphere and mixing with soils does not create an environmental or

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human health concern, one can conclude that this is not an issue requiring extensive evaluation.

Second, aside from the guidance provided by the ambient air quality standards and soil standards for Ra-226, there are no standards that apply to soils. There also is a paucity of guidance in the literature as to the levels of constituents in soils which might be associated with potential health effects. Certain other CERCLA sites have conducted site-specific studies to determine the concentrations of metals such as lead in the blood of residents exposed to soils located immediately adjacent to smelter sites. The areas immediately adjacent to the mill site in this case are unoccupied and present minimal opportunities for exposure to soils. Furthermore, the wind blows from the mill site toward Lincoln Park only about 7% of the year, and the average wind speed associated with that flow direction is light (5 mph). Light winds are not associated with the dusting conditions that would lift and deposit significant dust loads in Lincoln Park.

Third, there are no standards that apply to sediments, except the indirect indication of sediment quality provided by water quality measurements. The assumption here is that, any anomalous metals concentrations in sediments exhibiting a tendency to go into solution would be measured as a water quality impact. While this indirect means of monitoring sediment impacts is obviously limited to sediments in perennial streams, the fact that the water quality in the Arkansas River meets all applicable standards also suggests that the

sediment loading of the river from intermittent stream storm runoff is not causing a measurable impact.

### 32.5 Inhalation of Radon and Particulate

As noted above, at no time since Cotter began collecting air quality data have the ambient air quality standards for radon, particulate radionuclides or for total suspended particulate been violated, even at the mill site boundary.

These measurements are supported by air quality modeling calculations which also indicate that there are no adverse environmental or human health impacts associated with the air emissions attributable to the mill.

The National Academy of Sciences (NAS) recently published a report which finds that EPA's assumptions about the health effects associated with air emissions from uranium milling operations have been overestimated. The NAS concludes that there is no evidence that uranium milling air emissions have caused significant environmental or human health concerns. (Scientific Basis for Risk Assessment and Management of Uranium Mill Tailings, National Academy of Sciences, 1987).

### 32.6 Consumption of Fish From Impacted Surface Water Bodies

The Arkansas River complies with the aquatic life standards promulgated by the Colorado Water Quality Control Commission. Accordingly, the fish and other

aquatic organisms, if present in the segment of the river near Canon City, are, by definition, living in a safe environment that allows reproduction and perpetuation of the species, and can be consumed without causing a human health effect.

The only unknown situation with respect to fish consumption is the, as yet, undocumented cultivation of trout in the Willow Lakes specifically for the purpose of human consumption. Since the water quality in these lakes is not known at this time, this area will be evaluated as part of the work specified in Section 26 of the RAP.

### 32.7 Consumption of Fruits and Vegetables Irrigated With Impacted Water

The water use survey conducted in Lincoln Park by the U. S. Geological Survey in October, 1983, indicates that there are several small vegetable gardens irrigated with ground water in the Lincoln Park Water Use Survey Area. Several factors are critical to a determination of whether or not use of this water poses a concern with respect to the consumption of fruits and/or vegetables irrigated with it. First, in view of the fact that irrigation occurs during the spring, summer and early fall months, only the water quality data for that time frame should be used in the analysis. As it happens, the water quality in Lincoln Park during that period of the year improves significantly as a result of the very large volumes of irrigation return flow entering the ground water system due to the extensive use of three irrigation ditches in Lincoln Park. Second, many of the larger orchards and gardens in

Lincoln Park are irrigated by ditch water. Third, while limited data were collected regarding the metals concentrations in fruits and vegetables in 1979, there is virtually no information which describes whether, for example, molybdenum concentrates in the bark of an apple tree or in the apple itself. Additional data will be necessary to make this evaluation. Fourth, since the water quality improves significantly as a function of the downgradient distance from the mill, the location of each garden irrigated with ground water will determine the impacts, if any, associated with that water use.

#### 32.8 Consumption of Milk from Cows That Have Consumed Impacted Water

Since it is State and federal law that dairies use chlorinated water, it is unlikely that this is occurring. Based on interviews with local citizens, this requirement for chlorinated water is what led to the installation of the Canon City water distribution system in Lincoln Park in the first place.

#### 32.9 Consumption of Meat From Livestock That Have Consumed Impacted Water or Feed

As to whether the feed used for livestock is locally derived and irrigated with impacted ground water, the impact of this practice on livestock will depend upon whether water quality constituents are deposited in the edible part of the feed, and whether these water quality constituents in the edible part of the feed are metabolized in a manner that causes them to be present in



the edible portion of livestock flesh. The work specified in Section 32 of the RAP will provide the information needed to make that assessment. The same can be said with respect to livestock consumption of impacted water.

### 32.10 Summary

Based on the foregoing overview, it can be concluded that, unless Cotter is forced to comply with environmental standards that are different from those applied to other uranium milling operations and/or industrial facilities, the work scope for the health risk assessment can be narrowed to the following areas of inquiry:

1. The Lincoln Park water use survey required by Section 13 of the RAP will evaluate the ground water use patterns for drinking and agricultural purposes;
2. While direct exposure to soils and sediments does not appear to constitute an environmental or human health concern per se, this topic will be the subject of further inquiry in the context of consumption of fruits and/or vegetables, and milk and livestock flesh consumption;
3. Fish consumption need only focus on the results of the Willow Lakes study;
4. In conjunction with the results of the water use survey and any additional soils sampling, the consumption of fruits and vegetables irrigated with ground water also will be evaluated further;
5. As part of the water use survey, the sources of water used at local dairies will be determined; and
6. With respect to consumption of locally grown livestock, based on the water use survey, ground water consumption by livestock will be confirmed and the sampling of livestock tissue may be necessary.

The most troublesome aspect of EPA's comments on the RAP is that the information used to prepare the foregoing discussion has been in the public domain

for many years, and was not consulted by EPA in its preparation of comments on the RAP. Since this information has been known to the State and Cotter for that same period, there exists between the only two parties to this CERCLA litigation a common understanding of generally what health risk issues remain unresolved. It is this understanding that forms the basis for the RAP.

IN THE UNITED STATES DISTRICT COURT  
FOR THE DISTRICT OF COLORADO

Civil Action No. 83-C-2389

STATE OF COLORADO,

Plaintiff,

vs.

COTTER CORPORATION, a New Mexico corporation,

Defendant.

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Approved by  
the Court  
April 4, 1988

J. B. Ferguson  
U.S. District Judge

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FINAL CONSENT DECREE, ORDER, JUDGMENT  
AND REFERENCE TO SPECIAL MASTER

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FINAL CONSENT DECREE, ORDER, JUDGMENT  
AND REFERENCE TO SPECIAL MASTER  
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RECITALS

WHEREAS, on December 9, 1983, the State of Colorado (the "State"), and certain of its departments and agencies, filed a complaint against Cotter Corporation ("Cotter"), a New Mexico corporation, for damages for injury to, loss of, and destruction of natural resources pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 ("CERCLA"), 42 U.S.C. sec. 9601 et seq., concerning the Canon City uranium mill owned and operated by Cotter;

WHEREAS, on May 25, 1984, Cotter filed its answer to the State's complaint and filed counterclaims against the State pertaining to the past ownership by the State of a portion of the land on which the Canon City uranium mill is located;

WHEREAS, on July 6, 1984, the State filed its answer to Cotter's counterclaims;

WHEREAS, on April 8, 1985, the State filed its first amended complaint deleting the other named plaintiffs and adding a claim for response costs under CERCLA, together with pendent claims under Colorado law for statutory nuisance, common law nuisance, strict tort liability, and negligence;

WHEREAS, on September 4, 1985, the Court issued an order which: (1) granted Cotter's motion and dismissed without prejudice the State's pendent claims under Colorado law for statutory nuisance, common law nuisance, strict tort liability, and negligence; (2) denied Cotter's motion to dismiss the State's CERCLA claim because of the State's failure to present a claim letter sixty (60) days before commencing this action; and (3) denied Cotter's motion for summary judgment because of the State's alleged failure to incur any response costs before filing this action;

WHEREAS, on September 23, 1985, Cotter filed its answer to the State's first amended complaint and filed counterclaims against the State;

WHEREAS, on October 23, 1985, the State filed its answer to Cotter's counterclaims;

WHEREAS, on March 19, 1986, Cotter filed an amended answer and counterclaims;



WHEREAS, on April 10, 1986, the State filed its answer to Cotter's amended counterclaims;

WHEREAS, during the course of this litigation, the State and Cotter have made certain admissions;

WHEREAS, Cotter has denied and presently denies any and all legal or equitable liability in this action under any federal or state statute, regulation, ordinance or common law for any response costs or natural resource damages or other environmental liability of any kind resulting from Cotter's ownership of or operations on the Canon City uranium mill site;

WHEREAS, the State has denied and presently denies any and all legal or equitable liability in this action under any federal or state statute, regulation, ordinance or common law for any response costs or natural resource damages or other environmental liability of any kind resulting from the State's past ownership of a portion of the land on which the Canon City uranium mill is located;

WHEREAS, Cotter is the holder of Colorado Radioactive Materials License No. 369-01S, as amended (the "License"), issued by the State under the Colorado Radiation Control Act, as amended, and regulations promulgated thereunder, and Cotter has held the License since 1968, and, prior to that time, Cotter held a license issued by the United States Atomic

Energy Commission under the Atomic Energy Act of 1954, as amended, and regulations promulgated thereunder;

WHEREAS, on March 29, 1984 and June 29, 1984 Cotter filed applications with the State to renew and to amend the License;

WHEREAS, the State acted on the application to amend the License and issued amendment 20 on July 2, 1986 and amendment 22 on November 4, 1986 to the License requiring construction of a hydrologic barrier at the Soil Conservation Service Dam on Sand Creek, and the proceedings on the applications to renew and amend the License have not yet been concluded;

WHEREAS, concurrently with the filing of this Consent Decree, the State has issued License Amendment 24 which supersedes amendments 20 and 22 and requires the performance of the activities identified in this Consent Decree, including the construction of a hydrologic barrier at the Soil Conservation Service Dam on Sand Creek, and License Amendment 24 shall become final pursuant to Sections XIV and XXVIII below;

WHEREAS, on April 2, 1986, the State and the United States Environmental Protection Agency ("USEPA") executed a Memorandum of Agreement ("MOA") by which their roles and responsibilities were established such that the State is acting as lead agency with regard to the Lincoln Park site, an

area near Canon City listed on the National Priorities List ("NPL");

WHEREAS, the State represents that it has, consistent with its obligations under the MOA, advised the USEPA of settlement negotiations in this action, has consulted with the USEPA on that subject and on the Remedial Action Plan ("RAP") attached hereto and the State has provided the USEPA with an opportunity to review drafts of this Consent Decree and the RAP;

WHEREAS, the Parties agree that settlement and entry of this Consent Decree is made in good faith to avoid expensive and protracted litigation and to settle and resolve all claims and defenses between the Parties which have been or could have been asserted by the State or Cotter as of the effective date of this Consent Decree arising out of all matters which were raised during this litigation, relating to or arising from the Mill Facility or Impacted Areas, including any claims and defenses that were ruled upon by this Court; subject, however, to the Parties' rights to seek relief against nonparties to this Consent Decree;

WHEREAS, the Parties desire to achieve the timely implementation of an adequate and cost-effective remedy at the Canon City uranium mill that will effectively protect the public health, welfare and the environment;

WHEREAS, the terms and provisions of this Consent Decree represent a fair, reasonable, and equitable settlement of all matters which have been raised between the Parties to this litigation; and

WHEREAS, the Parties to this Consent Decree consent to the entry hereof as an Order, Judgment, and Reference to Special Master of this Court.

NOW, THEREFORE, it is hereby Ordered, Adjudged and Decreed as follows:

I. JURISDICTION

This Court has jurisdiction over the Parties and the subject matter of this action.

II. PARTIES BOUND

This Consent Decree shall apply to and be binding upon each of the Parties, their officers, agents, employees, successors in interest and assigns. The undersigned representatives of the respective Parties certify that they are fully authorized by the Party they represent to enter into the terms and conditions of this Consent Decree and to execute this Consent Decree and to legally bind that Party.

### III. DEFINITIONS

Words used in this Consent Decree are to be taken and understood in their common and ordinary sense unless this Consent Decree indicates that a different meaning was intended. Words having a technical meaning are to be interpreted in their technical sense. Notwithstanding the foregoing, whenever the following terms are used in this Consent Decree, the following meanings shall apply:

a. "CDH" means the Colorado Department of Health and its directors and employees;

b. "CERCLA" means the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 U.S.C. secs. 9601-57, as amended by the Superfund Amendments and Reauthorization Act of 1986 ("SARA") P.L. 99-499, 100 Stat. 1613 (1986), and as hereafter lawfully amended;

c. "Consent Decree" means this Consent Decree and all attached exhibits, including the Remedial Action Plan ("RAP"), which are hereby incorporated by reference;

d. "Cotter" means Cotter Corporation and its officers, directors, and employees;

e. "Contractor(s)" means the person(s) or company(ies) retained by or on behalf of Cotter to perform the Work. The Contractor(s) and any subcontractor(s) retained by or on behalf of the Contractor(s) shall be deemed to be

related by contract to Cotter within the meaning of 42 U.S.C. sec. 9607(b)(3);

f. "Final Submittal" means the plans, reports, specifications, quality control/quality assurance plans and documents, monitoring plans and documents, performance evaluation plans and documents and any other submittals from Cotter to the State required by this Consent Decree, as such submittal has been approved by the State or modified and/or approved by exhaustion of the dispute resolution process pursuant to Sections XII and XIII below;

g. "Full Surety" means the completed posting by Cotter of a financial assurance instrument, which is acceptable to the State pursuant to Section XV below, in an amount that is at least equal to the net present value of the projected cost of all of the remaining Work, including those contingencies set forth in the RAP, calculated as though it would be performed by an independent contractor retained by the State;

h. "Impacted Area(s)" shall mean any area identified in the RAP or by any surveys, studies, monitoring programs or remedial, corrective, or mitigative actions conducted pursuant to the RAP where a constituent, particulate, substance, spent catalyst material or other material from or related to the Mill Facility has been deposited, stored, disposed of, placed, or otherwise come to

be located and any other place where Work is planned or performed pursuant to the Consent Decree;

i. "License" means the Colorado Radioactive Materials License No. 369-01S including, among others, License Amendment 24, and as hereafter lawfully amended. With the exception of License Amendment 24, the License is not incorporated into this Consent Decree by reference or otherwise;

j. "License Amendment 24" means the amendment to the License issued to authorize performance of the Work. License Amendment 24 is incorporated into this Consent Decree by reference, and it is attached hereto as Appendix B;

k. "Mill Facility" means the site on which Cotter has conducted and continues to conduct uranium/vanadium ore, spent catalyst material and other materials storage, processing, disposal or other related activities, which site is specifically described as Section 16 and the SE/4 and S/2NE/4 of Section 9, Township 19 South, Range 70 West, 6 Principal Meridian, Fremont County, Colorado, and any additional sites in the nearby vicinity of or adjacent to the Mill Facility acquired by purchase, easement, or other ordinary commercial transaction by Cotter upon which Cotter conducts such activities;

l. "MOA" means the Memorandum of Agreement executed, on April 2, 1986, by the USEPA and the State to

establish their roles and responsibilities with regard to the Lincoln Park site, an area near Canon City listed on the NPL;

m. "NCP" means the National Oil and Hazardous Substances Pollution Contingency Plan, 40 C.F.R. Part 300, promulgated pursuant to 42 U.S.C. sec. 9605, and as hereafter lawfully amended;

n. "NPL" means the National Priorities List established pursuant to 42 U.S.C. sec. 9605(8)(B);

o. "OSC" means that individual appointed by the State as the onsite coordinator of the Work pursuant to Section VII below;

p. "Parties" means the State and Cotter;

q. "RAP" means the Remedial Action Plan describing the Work to be implemented at the Mill Facility and Impacted Areas, attached hereto as Appendix A and incorporated by reference into this Consent Decree, and all Final Submittals and all modifications and amendments made in accordance with Section XXIII;

r. "SM" means that individual appointed by Cotter as the site manager for the Work pursuant to Section VIII below;

s. "State" means the State of Colorado, its directors, agencies, departments, divisions and employees;

t. "USEPA" means the United States Environmental Protection Agency;



u. "Work" means all remedial, mitigative, corrective, and other actions to be performed by Cotter, required by or described in this Consent Decree, RAP, any schedules or plans established by the terms of this Consent Decree, the terms, conditions and schedules contained in any Final Submittal, and in License Amendment 24.

#### IV. COMMITMENTS OF STATE AND COTTER

A. The Parties agree and the Court hereby finds that the obligations imposed by this Consent Decree require performance by Cotter of actions which are reasonably designed to protect the public health, welfare and environment from hazardous substances which may be identified at or from the Mill Facility. Any enforcement of the obligations imposed by this Consent Decree constitute an action or proceeding by the State to enforce the State's police or regulatory power.

B. Cotter agrees to and shall timely finance both the Work and the Full Surety. In addition, Cotter agrees to and shall timely and properly perform the Work at its own cost.

C. The State shall oversee Cotter's performance of the Work for consistency and compliance with the provisions of this Consent Decree, which obligation is more fully described in Section VII herein.

D. In the event of a conflict between any requirement, term or provision of this Consent Decree and any requirement, term or provision of the RAP or Final Submittals thereunder, the requirements, terms and provisions of this Consent Decree shall control. (For the purposes of this Paragraph D, the term "Consent Decree" does not include the "RAP.")

E. This Consent Decree contains the entire agreement between the Parties. Any prior agreements, understandings or discussions between the Parties concerning any of the matters contained herein shall be of no force or effect after the effective date of this Consent Decree.

#### V. REMEDIAL ACTION

A. The Work shall be performed by Cotter at its expense in accordance with this Consent Decree.

B. The Work shall be conducted by Cotter in a good and workmanlike manner and shall be performed in accordance with the purposes, standards and requirements and within the time periods prescribed in the Consent Decree. Performance of the Work shall be subject to oversight by the State pursuant to Section VII below.

C. Subject to the provisions of Sections XIV and XXVI below, the Work shall be conducted in accordance with all

applicable federal, state and local statutes, regulations and ordinances.

D. Subject to Section XIV(F) below, Cotter shall apply for, obtain, and comply with all requisite federal, state and local permits, licenses, approvals, and consents necessary to perform the Work. If Cotter notifies the State that, in order to discharge its obligations under this Consent Decree, it is necessary to obtain a certain permit, license, approval, or consent, the State shall use its best efforts within its authority to assist Cotter in obtaining such permit, license, approval or consent deemed necessary by the Parties.

E. Cotter shall, at its sole expense, prepare and submit to the State for review a proposed plan(s) of substitution or exchange, pursuant to Colorado Revised Statutes sec. 37-80-120 (1973), and a proposed plan(s) for augmentation, which augmentation plan(s) shall also be filed with Division 2 of the Water Court, for any ground water and surface water depletions to the Arkansas River and its tributaries relating to the performance of the Work. The plan(s) for substitution or exchange shall be submitted simultaneously with the submission to the State of the proposal, plan or report to do the Work. Any Work that may result in ground water or surface water depletions to the Arkansas River or its tributaries shall not be commenced until

a plan(s) for substitution or exchange has been approved by the State Engineer on behalf of the State and implemented by Cotter at its sole expense. The proposed augmentation plan(s) shall be submitted to the State and filed with the Water Court within thirty (30) days of approval by the State Engineer of the plan(s) for substitution or exchange. Cotter shall diligently proceed to obtain approval of the Water Court of the proposed augmentation plan(s) and the approved augmentation plan(s) shall be implemented by Cotter at its sole expense.

F. The State shall not unreasonably delay or interfere with the orderly progress of the Work or with the ordinary mill operations of Cotter at the Mill Facility. The exercise by the State of its rights and obligations under this Consent Decree shall not constitute unreasonable delay or interference.

G. The State shall perform its obligations under this Consent Decree within the time periods specified, unless an extension of time to act is reasonable. If the Parties are unable to agree to an extension of time for the State to act, they shall proceed pursuant to Sections XII and XIII below. The obligation of the State to act shall be stayed pending dispute resolution. Failure of the State to act upon any proposal, plan, report or other submittal from Cotter within the established time shall be deemed constructive rejection of

the submittal, and the Parties shall proceed pursuant to Sections XII and XIII. Such constructive rejection shall not waive, or be deemed to prevent the application of, the "force majeure" provisions of Section IX.

H. 1. Cotter shall submit to the State certain proposals, plans, reports and other submittals relating to various elements of the Work as required by this Consent Decree. Cotter shall make all submittals within the time periods specified in the Consent Decree, subject to the provisions of Sections IX and X below. The State shall review and act upon each submittal as required by the Consent Decree. The State shall review each submittal to determine acceptability pursuant to the purposes, standards and requirements of this Consent Decree. The State shall act upon each submittal by notifying Cotter in writing that either:

a. The proposal, plan, report or other submittal is acceptable; or

b. The proposal, plan, report or other submittal is unacceptable, in which case, the reason(s) the submittal is unacceptable shall be stated with specificity.

2. If the submittal is acceptable, Cotter shall proceed to timely perform the Work in accordance with this Consent Decree and Final Submittals and in accordance with all plans and schedules contained therein. If the State

claims that the submittal is unacceptable, the Parties shall proceed in accordance with Sections XII and XIII.

I. Cotter shall permit the State, during the exercise of its oversight role pursuant to Section VII below, to observe the performance of the Work by Cotter, so that the State may advise Cotter of any unacceptable performance or failure of a remedial action component of the Work during the time it is being performed. During the time Work is being performed, if the State knows or has reason to know that there has been unacceptable performance or failure of a remedial action component of the Work, the State shall use its best efforts to promptly notify Cotter of such. Any failure of the State to promptly notify Cotter pursuant to this Paragraph I shall not operate as a waiver or estoppel of the State's other rights and obligations under this Consent Decree.

J. 1. Subject to the provisions of Sections XII and XIII, in the event of either the occurrence and/or discovery of a condition at or relating to the Mill Facility or Impacted Area(s), which was unknown or undetected on the effective date of this Consent Decree, and which condition may present a substantial adverse effect or consequence to the public health, welfare or the environment, Cotter shall submit to the State for review a plan to perform additional or revised Work to remediate, mitigate or correct the condition. The State shall review and act upon the plan within sixty (60)

days of its receipt. The State shall act upon each plan by notifying Cotter in writing that either:

- a. The plan is acceptable; or
- b. The plan is unacceptable, in which case the reason(s) the plan is unacceptable shall be stated with specificity.

2. If the plan is acceptable, Cotter shall proceed to timely perform the additional or revised Work in accordance with this Consent Decree and Final Submittals and in accordance with all plans and schedules contained therein. If the submittal is unacceptable, the Parties shall proceed in accordance with Sections XII and XIII.

K. 1. When Cotter has completed a remedial action component of the Work, it shall submit to the State a written notice of the completion within five (5) days of the date of completion and a final report, pursuant to the RAP, within the time specified in the RAP. The State shall review each final report to determine acceptability pursuant to the purposes, standards and requirements of this Consent Decree. The State shall act upon each final report within the time specified in the RAP by giving Cotter written notice that either:

- a. The final report is acceptable and the particular remedial action component of the Work has been satisfactorily completed; or

b. The final report is unacceptable and/or the performance of the particular remedial action component of the Work is unacceptable in which case the reason(s) shall be stated with specificity.

2. The notice may, at the State's option, either identify the appropriate additional or revised Work which shall be performed by Cotter at its expense, and/or may require Cotter to develop and submit within a reasonable time a plan for the performance of the appropriate additional or revised Work which shall be performed, upon approval by the State, by Cotter at its expense.

3. If the State gives written notice of unacceptable performance pursuant to Paragraph K(1)(b), above, within five (5) days of the receipt of the notice, Cotter shall give the State a written response, either:

a. Accepting the State's determination and initiate the performance of the appropriate additional or revised Work in a timely fashion, in which case the Parties shall modify the RAP and amend the Consent Decree, if necessary, pursuant to Section XXIII; or

b. Contesting the State's determination and stating its reasons with specificity, in which case the Parties shall immediately commence dispute resolution pursuant to Sections XII and XIII.



4. In the event that the Parties invoke the dispute resolution provisions of Sections XII and XIII of this Consent Decree with regard to a notice of unacceptable performance issued by the State, the final decision resulting from such dispute shall resolve the need for, the nature of and the time period for undertaking any appropriate additional or revised Work to be undertaken in consequence of any unacceptable performance, which Work shall be implemented by Cotter at its expense or by the State in the event of failure or refusal of Cotter to timely implement such actions in accordance with the plan(s) established. If the State implements said decision, Cotter shall pay to the State all costs and expenses incurred or to be incurred by the State in performance of said Work or if Cotter fails or refuses to provide such monies, the State may obtain them from the surety arrangement established pursuant to Section XV.

L. Cotter shall complete a review of the Work not less often than once each five (5) years after the initiation of the Work. The purpose of the review shall be to assure that human health and the environment are being protected by the Work being implemented. Cotter shall submit a written report to the State stating with specificity the results of the review within the time for completion of the review. If the State determines based on its review and the report that additional remedial, corrective or mitigative actions are

appropriate, the State may seek modification of the RAP or amendment of the Consent Decree pursuant to Section XXIII, or, in the event a condition at or related to the Mill Facility may present an imminent and substantial endangerment to public health, welfare or the environment, the State may proceed pursuant to Section VI.

#### VI. SPECIAL RESPONSE AUTHORITY

A. In the event that a condition at or related to the Mill Facility or Impacted Areas may present an imminent and substantial endangerment to public health, welfare or the environment, the State may:

1. Order Cotter to perform the Work in compliance with this Consent Decree, and/or implement actions appropriate to eliminate, correct or mitigate the endangerment. No stay of Cotter's obligations under this Paragraph A shall be granted unless Cotter establishes that its failure to perform any such obligation will not pose an imminent and substantial endangerment to the public health, welfare or environment. If Cotter fails or refuses to perform such Work and/or implement such actions in accordance with the schedule contained in the State's order, the State may, with prior or contemporaneous notice to Cotter, perform the Work and/or implement such actions. In the event the State performs such Work or implements such actions pursuant to this

Paragraph A, the State shall be entitled to obtain the monies determined necessary by the State to perform the Work and/or implement such actions from Cotter, or if Cotter fails or refuses to timely provide such monies, then from the surety arrangement pursuant to Section XV. Upon receipt of the State's order or notice pursuant to this Paragraph A, Cotter may invoke the dispute resolution provisions of Sections XII and XIII to examine only whether, under the circumstances, the activity undertaken is/was necessary and/or whether the amount determined and/or expended by the State is/was reasonable. If, under the circumstances, the activity is finally determined to be necessary and the expenditure reasonable, Cotter shall have no recourse against the State and shall within thirty (30) days of the determination, replace any funds removed from the surety established pursuant to Section XV so as to maintain the amount of surety then required by Section XV. If, under the circumstances, the activity is finally determined to be unnecessary or the expenditure unreasonable, the only relief available to Cotter shall be the reimbursement of that portion of the monies unreasonably taken or expended by the State and of the reasonable costs of restoring any portion of the Mill Facility and/or Impacted Areas to their condition prior to the State's action, if such restoration is appropriate. Such sums shall be reimbursed within thirty (30) days of the final determination. Nothing

in this Subparagraph (1) shall be construed to authorize any action prohibited by Paragraph B of this Section; or

2. Seek, with notice to Cotter, upon a forthwith hearing before the Special Master or before this Court pursuant to Paragraph D of this Section, an order compelling compliance with this Consent Decree, and/or to implement corrective and/or mitigative actions necessary to abate the imminent and substantial endangerment.

B. Whenever the State undertakes any part of the Work, and/or corrective or mitigative action pursuant to Section V or Section VI(A) above, Cotter shall not interfere with, impede, or otherwise hinder or delay the State's performance of such Work and/or action. In the event that the State undertakes any such performance, Cotter shall have available only that relief which is specified in Section VI(A) above and shall not be entitled to seek or obtain any other order which interferes with, impedes or otherwise hinders or delays the State's performance or access to the monies described in Section V or Section VI(A) above. Nothing in this Paragraph B shall be construed to limit or impair any rights Cotter may have under federal or state law to seek, following the final conclusion of the dispute resolution process authorized in Paragraph A(1) of this Section, appropriate relief based on activities or expenditures undertaken by the State pursuant to this Section VI.

C. Whether or not an "imminent and substantial endangerment" may exist in a particular case shall be determined from an analysis of the facts and circumstances prevailing in that case and applicable law. However, for purposes of this Consent Decree only, "imminent and substantial endangerment to the public health, welfare, or the environment," shall be conclusively presumed to include failure of the structural integrity of the main or secondary impoundment.

D. In the event that the State determines that a condition has arisen which may present an imminent and substantial endangerment to the public health, welfare or the environment because of a failure of a remedial action component of the Work or an actual or threatened release of a hazardous substance from the Mill Facility, the State may directly petition, with notice to Cotter and without need to invoke or exhaust any dispute resolution provision of this Consent Decree, any Court or administrative authority or tribunal of competent jurisdiction for such relief as may be necessary to immediately abate the danger or threat. If the State so elects, it may in its petition seek direct review by this Court and, in that event, the matter raised in that petition shall not be deemed referred to the Special Master without further, specific order of this Court.

E. Subject to the provisions of Section XIV, the State may also take other action within its authority under federal, state and local statutes, rules, regulations and ordinances.

#### VII. OVERSIGHT OF REMEDIAL ACTION

A. Pursuant to the payment provisions of Section XVIII and the dispute resolution provisions of Sections XII and XIII below, the State, at its sole expense, shall oversee the performance of the Work for consistency and compliance with the provisions of this Consent Decree and with subsequently enacted, modified, or promulgated statutes or regulations which the State asserts are applicable. In addition to any necessary and proper oversight which the State may undertake at the Mill Facility and Impacted Area(s), the State shall:

1. Coordinate oversight under this Consent Decree with regulatory activities under applicable statutes and regulations to assure that regulatory costs chargeable to Cotter are not duplicative of the costs of the State's oversight pursuant to this Section VII;

2. Subject to state and federal radiation control statutes, regulations and rules, conduct all inspections required under the Colorado Radiation Control Act and regulations promulgated thereunder with respect to the

Mill Facility. The cost of such inspections which do not unnecessarily duplicate inspections conducted under this Consent Decree shall be charged to Cotter's inspection costs, pursuant to the Colorado Radiation Control Act and the regulations promulgated thereunder. State personnel shall exercise their best efforts to minimize such duplication; and

3. Coordinate licensing and permitting under state laws and regulations promulgated thereunder so as to minimize duplication of costs and effort by state personnel and to preclude inconsistent requirements.

B. On or before the effective date of this Consent Decree, the State shall designate an OSC for the Work. The State may also designate other representatives including counsel for and/or other employees of the State and consultants to observe and monitor all progress of any activity and to inspect and copy records of any activity undertaken pursuant to this Consent Decree pursuant to Paragraph A of this Section. In addition to the authority necessary and proper to accomplish the foregoing, the OSC shall have the same authority as that vested in a federal "On-Scene Coordinator" under the NCP; provided, however, that the OSC shall only be granted access to mill operations buildings as may be necessary to fulfill the responsibilities of the OSC pursuant to this Consent Decree. In addition:

1. The OSC shall be appointed by the Executive Director of CDH with the advice and consent of the Colorado Attorney General or their duly designated representatives;

2. Following appointment of the OSC or his/her successor, the State shall promptly notify Cotter of the name, title and qualifications of the OSC; and

3. The State shall have the right to change its OSC. The State shall notify Cotter in writing at least one (1) week prior to such change and shall provide Cotter with the name, title and qualifications of the individual who will next be serving as OSC.

#### VIII. SITE MANAGER FOR REMEDIAL ACTION

A. On or before the effective date of this Consent Decree, Cotter shall designate, in writing, an individual qualified to be its SM, and promptly notify the State of the name, title and qualifications of the SM.

B. The SM shall oversee Cotter's performance of the RAP and shall be responsible for the conduct, direction, and supervision of the Work.

C. Cotter shall have the right to change its SM. Cotter shall notify the State in writing at least one (1) week prior to the change, and shall provide the State with the name, title and qualifications of the individual who will next be serving as SM.



**IX. DELAY OF PERFORMANCE AND "FORCE MAJEURE"**

A. Any failure by Cotter to perform or timely perform a particular obligation under this Consent Decree that is not caused by "force majeure" shall be an unexcused delay, unless the State expressly agrees in writing that the cause and length of the delay are reasonable.

B. Subject to Section 3.1.2 of the RAP, "force majeure" shall excuse the performance or timely performance, as the case may be. "Force majeure," for purposes of this Consent Decree, is defined as a reasonably unforeseeable event arising from circumstances beyond the control of Cotter which unavoidably causes a prevention or delay of the performance of any obligation under this Consent Decree, which event or results of the event could not have been prevented or minimized by appropriate measures. Depending on the circumstances, "force majeure" may include, by way of example but not of limitation, the following:

1. Act of God;
2. Act of war;
3. Labor disturbances including strikes, work stoppages or other similar labor disputes; provided that Cotter takes all reasonable and necessary action to promptly resolve such labor disturbances; and provided further that, nothing herein shall be deemed to obligate Cotter or any other

person or entity to forestall or settle any such labor disturbance against its will;

4. Any modification, cessation or delay of the Work caused by state, federal or local government agencies or authorities;

5. Time required to obtain necessary governmental permits, licenses, approvals, and consents for implementation of the Work, which are not described in a Final Submittal, provided that the initial application for such permit, license, approval, or consent was timely made and Cotter timely provided all information required to obtain the same;

6. The inability to obtain or timely obtain access to property not owned or controlled by Cotter necessary for the implementation of the Work, provided that Cotter has complied with the provisions of Section XI(E) below; and

7. An act or omission of any third party over whom Cotter has no control, not including Cotter's agents, Contractors, and subcontractors.

C. Without limitation, "force majeure" shall not include the following:

1. Increased costs or expenses in implementing the Work; and

2. Failure to apply in a timely manner and timely provide all required information for any necessary

governmental permit, license, approval or consent, or failure to seek in a timely manner to obtain any necessary access to property not owned or controlled by Cotter.

D. 1. In the event Cotter knows or has reason to know that a "force majeure" has occurred or is occurring, or there has been or will be a delay in the inception or completion of the Work in accordance with the schedules set forth in the Consent Decree, Cotter shall promptly provide oral notification to the OSC of the "force majeure" or other delay and its cause, and to the extent possible, the anticipated length of the "force majeure" or other delay, the elements of the Work affected, the measures taken or to be taken to prevent or minimize the effects of the "force majeure" or other delay and the time within which Cotter intends to implement these measures; and

2. Not later than five (5) business days after Cotter knows or has reason to know that a "force majeure" has occurred or is occurring or there has been or will be a delay in the inception or completion of the Work in accordance with the schedules set forth in the Consent Decree, Cotter shall provide the State with written notice of the "force majeure" or other delay specifying in detail the anticipated length of the "force majeure" or other delay and its cause, the elements of the Work affected, the measures taken and to be taken to prevent or minimize the effects of the "force majeure" or

other delay, and the time within which Cotter intends to implement these measures. Failure to give written notice of a "force majeure" pursuant to this Paragraph D(2) shall be a waiver by Cotter of the claim of "force majeure."

E. The Parties shall modify the RAP, and if necessary jointly petition the Court for an amendment to this Consent Decree, pursuant to Section XXIII below, and shall amend the License if necessary pursuant to Section XIV below, to provide such additional time as may be necessary to allow completion of the Work affected by the "force majeure" or other delay and any additional Work needed because of the "force majeure" or other delay, if:

1. The measures taken or to be taken to prevent or minimize the effects of the "force majeure" or other delay and the time within which Cotter proposes to implement these measures are acceptable to the State; and

2. Either of the following:

(a) The Parties agree that a "force majeure" has occurred or is occurring; or

(b) The Parties agree that the delay was otherwise reasonable under the circumstances.

F. If the Parties disagree that the delay is or was attributable to a "force majeure" or if the Parties disagree about the measures taken or to be taken to prevent or minimize the delay resulting from a "force majeure" or if they disagree

about the timetable by which Cotter intends to implement those measures, then the dispute shall be resolved pursuant to the provisions of Sections XII and XIII below.

G. Notwithstanding any other provision of this Consent Decree, absent a "force majeure" or express agreement by the State pursuant to Paragraph E(2)(b) of this Section, Cotter shall not be excused from the consequence of any delay (including any applicable penalties and/or contempt sanctions) or be entitled to unilaterally invoke the dispute resolution procedures under Sections XII and XIII of this Consent Decree with regard to whether the delay was otherwise reasonable under the circumstances.

X. NOTICES, REPORTING AND RECORD KEEPING

A. In the event Cotter determines that there is or may be a failure of any remedial action component of the Work to meet the purposes, standards or requirements of the Consent Decree, Cotter shall immediately provide oral notification to the OSC of the actual or anticipated failure and its cause. Not later than five (5) business days after oral notification to the OSC, Cotter shall provide the State with written notice specifying in detail the actual or anticipated failure and its cause, the Work affected by the actual or anticipated failure, the measures taken and to be taken to prevent, correct and/or mitigate the actual or anticipated failure, and the time

within which Cotter intends to implement these measures, which all shall be subject to review and approval by the State.

B. The State shall provide Cotter five (5) days oral notice of the date it will initiate remedial actions implemented by the State pursuant to Section 31 of the RAP. Cotter shall be entitled to observe the actions taken by the State pursuant to Section 31 of the RAP and shall be entitled, at the option and expense of Cotter, to take split samples pursuant to Section 31 of the RAP.

C. Cotter shall provide the State with five (5) days oral notice of the dates it will initiate the remedial, corrective, or mitigative actions to be implemented by Cotter pursuant to the RAP.

D. Cotter shall provide to the State all proposals, plans, reports and other submittals required by the Consent Decree.

E. Cotter shall submit to the OSC copies of all reports and required documentation that relate to implementation of the Work, which reports and documentation are otherwise required pursuant to the terms of applicable federal, state and local statutes, regulations, ordinances, licenses and permits.

F. All records, documents, information, and raw data of whatever kind, nature and description within the custody or control of Cotter and its Contractors,

subcontractors and agents relating to performance of the Work shall be available at all times to the OSC and any other representative of the State designated in writing by the Executive Director of CDH, the Attorney General of Colorado or by the OSC or their duly designated representatives for inspection and copying.

G. Until completion of the Work and termination of this Consent Decree, the Parties shall preserve, and shall instruct their Contractors, subcontractors, consultants and agents to preserve all records, documents and information of whatever kind, nature or description relating to performance of the Work which are not confidential attorney-client communications. Upon completion of the Work and termination of this Consent Decree, copies of all such records, documents and information shall be delivered promptly to the respective Parties.

H. Subject to the provisions of Colorado Revised Statutes secs. 24-72-201 to -205 (1973), all information and documents submitted by Cotter to the State pursuant to this Consent Decree shall be available for public inspection and copying.

#### XI. ACCESS AND RESTRICTIVE COVENANTS

A. Subject to the provisions of Paragraph B of this Section, unrestricted access to the Mill Facility, and

Impacted Areas which are owned or controlled by Cotter, excluding office areas, but subject to the provisions of Section X(F), is hereby granted and ordered to the State for the purposes of performing the oversight functions of the State pursuant to Section VII above, performing remedial, corrective or mitigative actions pursuant to Sections V(K) and VI and performing the Work pursuant to Section XV.

B. As a condition to access pursuant to Paragraph A of this section, representatives of the State shall be required to identify themselves, comply with Cotter's ordinary sign-in and security procedures, comply with all applicable state and federal statutes, including applicable regulations of the United States Mine Safety and Health Administration, comply with applicable health and safety regulations, plans, and procedures, which regulations, plans and procedures have been provided to CDH pursuant to the License and acknowledge receipt of an advisement that certain hazards exist or may exist at the Mill Facility. Such advisement shall not be in a form which waives or requires the waiver of rights or claims otherwise cognizable under federal or state statutory or common law. Cotter's right to require compliance with its ordinary sign-in and security procedures and its applicable health and safety regulations, plans and procedures shall not be used to impede or interfere with the State's right of unrestricted access to the Mill Facility and Impacted Areas



pursuant To Paragraph A of this Section. Cotter shall promptly provide oral notice to the OSC of any claimed violation by any representative of the State of its ordinary sign-in and security procedures and its applicable health and safety regulations, plans and procedures that have been provided to CDH pursuant to the License.

C. Nothing herein shall be deemed to preempt, limit or restrict in any way any and all other rights of the State to access at the Mill Facility and Impacted Areas, including the right to inspect and copy documents, take samples, obtain evidence, and exercise such other powers which the State may otherwise have pursuant to any and all applicable federal, state and local statutes, regulations, ordinances, rules of procedure, licenses, and permits.

D. No property of the State or its consultants or representatives left at the Mill Facility or Impacted Area(s) shall be deemed a fixture and all such property shall remain the property of the State or its consultants or representatives.

E. 1. To the extent access to, over, and/or beneath property, other than the Mill Facility, which is not owned or controlled by Cotter, is required for the proper and complete performance of the Work, Cotter shall expeditiously use its best efforts to obtain such access, once the need for such access is identified. The need for access shall be

identified no later than the identification of the location of specific remedial, corrective, or mitigative activities to be performed on property other than the Mill Facility. Cotter's best efforts shall include, but are not limited to, the payment of reasonable fees to obtain title, rights-of-way, rights of entry, easements, permits, approvals, and other access agreements. Cotter shall not be required to pay an unreasonable fee for access.

2. Any access agreement obtained by Cotter shall permit the same access to the State for the purpose of performing its oversight functions pursuant to Section VII above, performing corrective, mitigative or remedial actions pursuant to Sections V(K) and VI and performing the Work pursuant to Section XV. If necessary, the State shall use its best efforts, consistent with its legal authority to assist Cotter in obtaining access; provided that, Cotter shall pay the reasonable fees to obtain access.

F. To the extent the remedial actions performed by the State pursuant to Section 31 of the RAP requires access to property not owned or controlled by Cotter, the State shall be responsible for obtaining access agreements to such property. Such agreements shall permit reasonable access to Cotter for the purpose of observing the activities of the State pursuant to Section X(B) above. If necessary, Cotter shall use its best efforts, not including the payment of access fees, to

assist the State in obtaining access. In the event Cotter owns or controls the property, Cotter shall grant access to the State and its consultants and agents.

G. No conveyance of title, easement, or any other legal interest in any portion of the Mill Facility shall be consummated without a provision permitting the continued, unimpeded operation and maintenance of all components of and all structures and improvements resulting from or related to the Work, the timely performance of any Work to be done pursuant to this Consent Decree, and the unrestricted access to the Mill Facility granted to the State herein, and all such conveyances of title and/or any legal interest in any portion of the Mill Facility shall contain a covenant to permit such unrestricted access and the unimpeded operation and maintenance of such structures and improvements and performance of such Work. At least ninety (90) days prior to any conveyance of title or any interest in all or any portion of the Mill Facility, the person(s) owning such property and/or legal interest shall notify the State by registered mail of the intent of such person(s) to convey title and/or any legal interest in such property. This notice shall contain a detailed description of the legal interest and property intended to be conveyed, an identification of and current mailing address for the person(s) to whom such legal interest will be conveyed, and an exact copy of the

provision(s) of the conveyance instrument permitting the continued operation, maintenance, performance and unrestricted access prescribed herein. The restrictions and obligations set forth in this Paragraph G shall run with the land and shall be binding upon any and all persons who acquire title or any legal interest in all or any portion of the Mill Facility.

H. Cotter shall file, at its cost, a copy of this Consent Decree and all attachments to it in the office of the clerk and recorder of Fremont County, Colorado as an encumbrance upon all parcels comprising the Mill Facility. Cotter shall execute such instruments and documents and pay such costs, if any, as may be required to entitle the terms of this Consent Decree to be so recorded and to operate as a covenant running with the land. Upon termination of this Consent Decree, the State shall record a release of encumbrance(s) on the subject parcels.

## XII. DISPUTE RESOLUTION

A. 1. Unless expressly prevented in this Consent Decree, and subject to Sections VI and XIV, in the event a dispute arises under this Consent Decree, this Section and Section XIII set forth the methods for resolution of such a dispute. Prior to commencement of formal resolution pursuant to Paragraph B of this Section and Section XIII below, the

Parties shall attempt to resolve the dispute by informal negotiations:

- a. First, between the OSC and SM;
- b. Second, among designated representatives of the Parties having authority to act on behalf of the Parties, with counsel present if any Party so requests; and
- c. Third, informal mediation between the Parties with the assistance of the Settlement Mediator, designated pursuant to Section XIII(A) below.

2. If the dispute is resolved pursuant to this Paragraph A, the Parties shall, as necessary, modify the RAP, jointly petition the Court for amendment of this Consent Decree, pursuant to Section XXIII, and amend the License pursuant to Section XIV to reflect the agreement reached. The informal dispute resolution period shall be not more than thirty (30) days; provided, however, that the Parties may by mutual written agreement and for good cause, extend the time for informal dispute resolution by an additional ten (10) days. In no event shall the total time for informal dispute resolution exceed forty (40) days. Informal dispute resolution of any issue need not be continued if, in the opinion of any Party, to do so would be futile, in which event, the Party terminating the informal dispute resolution

shall file a petition for formal dispute resolution pursuant to Paragraph B of this Section.

B. 1. When a dispute cannot be resolved by the processes described in Paragraph A above, it shall be resolved by formal dispute resolution. The formal resolution of disputes shall be either by reviewing a decision made by the State based on an administrative record or by conducting adjudicatory hearings. Disputes regarding the following issues shall be resolved by reviewing a decision made by the State based on an administrative record:

a. Performance of the ground water monitoring program pursuant to Sections 14 and 15 of the RAP;

b. Performance of the air monitoring program pursuant to Section 23 of the RAP;

c. Revegetation of the old tailings ponds area pursuant to Section 17 of the RAP;

d. Revegetation of the Mill Facility pursuant to Section 21 of the RAP;

e. Construction and maintenance of the compacted clay ore pads pursuant to Section 18 of the RAP;

f. Road watering pursuant to Section 22 of the RAP;

g. Performance of the Lincoln Park scintillometer survey pursuant to Section 25 of the RAP; and

— h. Performance of the site adjacent soil program pursuant to Section 24 of the RAP, with the exception of the requirements contained in paragraph 1 of Section 24.2, paragraph 1 of Section 24.3, and paragraphs 1 and 2 of Section 24.4.

2. Unless otherwise agreed to by the Parties, with the exception of the matters listed in Subparagraphs (B)(1)(a), (b), (c), (d), (e), (f), (g) and (h), above, all other formal dispute resolutions shall be accomplished by conducting adjudicatory hearings.

3. In the event that a decision made by the State based on an administrative record is reviewed:

a. The State shall designate the administrative record upon which the decision will be based, which shall include this Consent Decree, any relevant proposals, plans, reports or other submittals made by Cotter, any relevant notices or responses made by the State, any Final Submittal, and any other information or documents including expert reports, plans or designs upon which the State bases its decision;

b. Cotter may supplement the administrative record with any additional relevant written information upon which Cotter bases its position including, but not limited to, expert reports, plans or designs;

c. The development of the administrative record shall not include an adjudicatory hearing;

d. The State shall make its decision in writing and based on the administrative record;

e. The decision shall be reviewed by the Special Master based on the administrative record.

C. Either party may elect to file a petition with the Special Master designated pursuant to Section XIII(B) below for formal dispute resolution. The petition shall identify the issue(s) in dispute, the relief sought by that Party and the means of resolution. The other Party shall file a response to the petition within ten (10) days of service of the petition or within such time as the Special Master may order. Every petition and response filed with the Special Master pursuant to this subsection shall be filed concurrently with this Court.

D. 1. In the event a dispute arises under this Consent Decree relating to the Work, the obligation of Cotter to perform that portion of the Work shall not be stayed pending final resolution of the dispute through informal or formal proceedings, unless Cotter shows good cause for a stay. A request by Cotter for a stay of the Work shall be reviewed first between the OSC and SM. If the OSC and SM do not agree, a request by Cotter for a stay shall be reviewed among designated representatives of the Parties having authority to



act on behalf of the Parties, with counsel present if any Party so requests. If the Parties cannot agree, Cotter may file a motion for stay directly with the Special Master. The Special Master shall then resolve the motion for stay and the matter(s) giving rise to the dispute, and the Settlement Mediator shall not attempt to resolve either the motion for stay or the matter(s) giving rise to the dispute. In the absence of agreement by the State or an order of the Special Master, the obligation of Cotter to perform the Work shall not be stayed.

2. In no event shall there be a stay if an imminent and substantial endangerment to the public health, welfare or the environment may exist if the Work is stayed.

### XIII. APPOINTMENTS FOR DISPUTE RESOLUTION

A. Upon the agreement of the Parties, the Court hereby appoints Richard W. Dana of the Judicial Arbiter Group, 2919 Valmont Road, Suite 206, Boulder, Colorado 80301, as the Settlement Mediator to mediate disputes between the Parties arising under this Consent Decree as set forth in Section XII(A) above. If Richard W. Dana is unable to serve as Settlement Mediator pursuant to this Consent Decree, the Court shall appoint an alternate or successor Settlement Mediator, as the case may be, upon agreement of the Parties. In the absence of agreement by the Parties, an alternate or successor

Settlement Mediator shall be appointed by the Court following separate recommendation by the Parties. The Settlement Mediator shall promptly consider and attempt to resolve all disputes between the Parties arising under the Consent Decree above by informal mediation of disputed issues pursuant to section XII(A) above.

B. Pursuant to Rule 53 of the Federal Rules of Civil Procedure, the Court hereby appoints Charles Goldberg of the law firm of Rothgerber Appel Powers & Johnson, Denver, Colorado, as the Special Master to formally resolve disputes between the Parties arising under this Consent Decree, motions for stay applications, petitions for abatement orders pursuant to Section VI(A)(2) and motions for contempt. If Charles Goldberg is unable to serve as Special Master pursuant to this Consent Decree, the Court shall appoint an alternate or successor Special Master, as the case may be, following the joint recommendation of the Parties, if they are in agreement on the appointment, or following the separate recommendation of the Parties, if they are not in agreement on the appointment. The Special Master shall promptly consider and resolve all disputes that have not been resolved pursuant to Section XII(A) above by reviewing a decision made by the State based on an administrative record or by conducting adjudicatory hearings and in either case making findings of fact, conclusions of law and recommendations to the Court.

C. The Special Master has and shall exercise the power to regulate all proceedings in every hearing before him and to do all acts and take all measures necessary or proper for the efficient performance of his duties under this Consent Decree, pursuant to Rule 53 of the Federal Rules of Civil Procedure.

D. 1. Without limiting the authority or powers of the Special Master pursuant to Rule 53 of the Federal Rules of Civil Procedure, in the event an adjudicatory hearing is conducted, the Special Master may:

a. require production before him of evidence upon matters in dispute, including the production of books, papers, vouchers, documents, data, analyses, calculations, and writings in whatever form stored or recorded;

b. rule upon the admissibility of evidence;

c. put witnesses on oath;

d. call the Parties and other witnesses and examine them upon oath, allowing examination and cross-examination of them by the Parties;

e. for a subpoenaed witness or a noticed Party who, without adequate excuse, fails to appear or give evidence as required, punish as for a contempt and impose the

consequences, penalties, and remedies provided in Rules 37 and 45 of the Federal Rules of Civil Procedure; and

f. retain, upon the separate or joint recommendation of the Parties, independent expert consultants to advise the Special Master on technical matters pertaining to the dispute. The cost of retention of independent expert consultants shall be part of the costs reimbursable to the Special Master, as provided below.

2. The Parties may procure the attendance of witnesses before the Special Master by the issuance and service of subpoenas as provided in Rule 45 of the Federal Rules of Civil Procedure.

3. When a Party so requests, the Special Master shall make a record of the evidence offered and excluded in the same manner and subject to the same limitations as provided in the Federal Rules of Evidence for a court sitting without a jury. The cost of recording and transcribing the proceedings shall be part of the costs reimbursable to the Special Master, as provided below.

E. Without limiting the authority or powers of the Special Master pursuant to Rule 53 of the Federal Rules of Civil Procedure, in all formal dispute resolution by the Special Master:

1. Each decision of the Special Master shall be reflected in a written report or stated orally on the

record, and shall set forth the relevant findings of fact, conclusions of law and recommendations. Any oral decision shall subsequently be set forth in a written report. The report of the Special Master shall be filed simultaneously with the Court and served upon the Parties.

2. The Parties agree and the Court hereby orders that the Special Master's findings of fact shall be final and only questions of law arising from the Special Master's report shall be considered by the Court.

3. The conclusions of law of the Special Master shall become final and binding upon the Parties and enforceable as an order of this Court unless a Party objects to the Special Master's decision in whole or in part by moving the Court to modify or reject the conclusions of law of the Special Master within ten (10) days after receiving the Special Master's written report. Such motion shall be served in writing and upon all Parties and the Special Master and shall set forth specifically the legal basis for the motion and the relief desired. Pursuant to Rule 53 of the Federal Rules of Civil Procedure, upon the timely filing of a motion with the Court, the Special Master shall forthwith file with the Court a transcript of the proceedings and of the evidence and the original exhibits.

4. If the Special Master finds and concludes that the relief recommended in his decision is appropriate to

abate a condition which may present an imminent and substantial endangerment to public health, welfare or the environment, the Special Master's decision shall not be stayed and shall be binding upon the Parties unless and until it is modified or rejected in whole or in part by the Court pursuant to a timely application for judicial review. In all other cases in which either Party has timely requested judicial review, the effect of the Special Master's decision shall not be stayed pending resolution by the Court, unless otherwise ordered by the Special Master or the Court upon a showing of good cause by the Party requesting the stay.

F. The Parties shall pay equally the fees and expenses of the Settlement Mediator. The fees and expenses of the Special Master shall be paid by Cotter, unless it is determined that the State's position in the relevant proceeding was unreasonable, in which case the fees and expenses of the Special Master shall be paid by the State.

G. The Settlement Mediator and Special Master shall submit invoices to the Court no more frequently than monthly, with copies to the Parties, for any month in which dispute resolution and proceedings and/or other appropriate general activities occur pursuant to this Consent Decree. Fees and expenses of the Settlement Mediator or Special Master incurred in connection with any dispute resolution proceeding hereunder shall be deemed approved by the Court unless any Party

presents an objection to the Court within thirty (30) days following receipt of the Settlement Mediator's or Special Master's invoice. Such fees and expenses shall be paid by the responsible Party or Parties within sixty (60) days following submittal of the Settlement Mediator's or Special Master's invoice, provided that the fees and expenses are not objected to, and if an objection is presented to the Court, the fees and expenses shall be paid as ordered by the Court. When the Party or Parties whose duty it is to pay the Settlement Mediator's or Special Master's fees and expenses has failed to do so within sixty (60) days following submittal of the Settlement Mediator's or Special Master's invoice or as ordered by the Court, the Settlement Mediator or Special Master shall be entitled to a writ of execution against the delinquent Party or Parties.

H. The State's reasonable costs and attorneys' fees incurred in connection with any formal dispute resolution proceeding hereunder, including any application for reconsideration or judicial review, shall be paid to the State by Cotter within sixty (60) days of the final resolution of such matter unless it is finally determined that the State's position in the relevant proceeding was unreasonable, in which case all reasonable costs and attorneys' fees of both Parties shall be paid by the State. If the State seeks reimbursement for its costs and attorneys' fees, it shall first submit to

the Special Master and to Cotter a detailed accounting of such costs and fees. At the request of Cotter, the Special Master shall review the State's costs and attorneys' fees submittal, and determine the reasonableness of such costs and fees and whether the State's position was unreasonable.

I. In any proceeding involving contempt under this Consent Decree or civil penalties sought by the State under Section XVII, the prevailing Party shall be entitled to recover its reasonable costs and attorneys' fees incurred in connection with said proceeding. If the prevailing Party seeks reimbursement for its costs and attorneys' fees, it shall first submit to the Special Master and to the other Party a detailed accounting of such costs and attorneys' fees. At the request of any Party, the Special Master shall review such costs and attorneys' fees submitted, and determine their reasonableness.

**XIV. STATE-ISSUED PERMITS AND RELATIONSHIP  
TO THIS CONSENT DECREE**

A. Upon entry of this Consent Decree, Amendment 24 to the License, which is referenced and incorporated herein, shall become final unless appealed by a nonparty to this Consent Decree. Cotter waives its rights to administrative and judicial review of License Amendment 24 under state law; provided, however, that if, for any reason, the conditions of License Amendment 24 are modified at the conclusion of the



public comment period provided in Section XXVIII, Cotter shall retain all rights of review regarding such modification.

B. Any future amendment to the License which is not directly or indirectly inconsistent with the terms and conditions of this Consent Decree, initiated by either the State or Cotter, shall be pursuant to the applicable provisions of state law. The State acknowledges Cotter's right to raise substantive and procedural issues of preemption by this Consent Decree before the state courts. If any proposed amendment to the License is directly or indirectly inconsistent with any provisions of this Consent Decree, Cotter may invoke the dispute resolution provisions of Sections XII and XIII with regard to such amendment only if a nonparty to this Consent Decree has not sought status as a party to such state law proceeding. Such invocation by Cotter shall be deemed a waiver by it of all rights of review pursuant to state law.

C. Enforcement of the provisions of the License shall, at the option of the State, be under the provisions of this Consent Decree or under applicable provisions of state law; provided, however, that Cotter may elect to invoke the dispute resolution provisions of Sections XII and XIII with respect to any notice of violation issued pursuant to Colorado Revised Statutes sec. 25-11-107 (1973), regarding any obligations imposed by this Consent Decree to determine only

whether a violation has occurred. Any subsequent proceedings, at the option of the State, shall be under the provisions of this Consent Decree or under applicable provisions of state law.

D. If any other permit issued by the State prescribes terms and conditions which are not directly or indirectly inconsistent with the terms and conditions of this Consent Decree, then any review of such terms and conditions shall be pursuant to the applicable provisions of state law. The State acknowledges Cotter's rights to raise substantive and procedural issues of preemption by this Consent Decree before the state courts. If the terms or conditions of any such permit are directly or indirectly inconsistent with any provision of this Consent Decree, then Cotter may invoke the dispute resolution provisions of Sections XII and XIII with regard to the review of such terms and conditions only if a nonparty to this Consent Decree has not sought status as a party to such state law proceeding. Such invocation by Cotter shall be deemed a waiver by it of all rights of review pursuant to state law.

E. Enforcement of the provisions of other state-issued permits shall, at the option of the State, be under the provisions of this Consent Decree or under applicable provisions of state law; provided, however, that Cotter may elect to invoke the dispute resolution provisions of Sections

XII and XIII, with respect to any notice of violation issued, regarding any obligations imposed by this Consent Decree to determine only whether a violation has occurred. Any subsequent proceedings, at the option of the State, shall be under the provisions of this Consent Decree or under applicable provisions of state law.

F. Cotter shall not be required to obtain any State permit that may be necessary pursuant to the future enactment, amendment, or promulgation of any applicable state statute or regulation for the portion of any removal or remedial action conducted entirely onsite, where such action is selected and carried out in compliance with this Consent Decree. Nevertheless, Cotter shall comply with and the State may enforce in this Court any federal or state standard, requirement, criteria or limitation to which the remedial action is otherwise required to conform. Cotter shall obtain and/or renew any other necessary federal, state and local permits. The first sentence of this Paragraph F does not apply to the License or any future amendment of the License or to the plans and authorizations required by Section V(E).

G. The Mill Facility will be decommissioned, closed, and reclaimed and monitored after decommissioning, closure and reclamation pursuant to the Colorado Radiation Control Act and regulations promulgated thereunder, and any

other applicable federal, state and local statute, regulation and ordinance.

H. The plans required pursuant to Section V(E) of this Consent Decree shall be reviewed pursuant to the applicable provisions of state law.

I. Notwithstanding Cotter's right to invoke the dispute resolution provisions of this Consent Decree as provided in this Section XIV, such rights shall not foreclose any rights nonparties to this Consent Decree may have under federal, state or local law to receive public notice, or to comment on, intervene in, appeal from, or otherwise participate in proceedings with respect to amendments to the License or with respect to permits issued by the State.

J. The selection of a means of enforcement or review pursuant to this Section XIV shall preclude the subsequent selection by either Party of the means not selected, except as otherwise provided herein, for the enforcement or review of the same issue.

#### XV. SURETY FOR PERFORMANCE

A. Cotter shall provide and maintain Full Surety in accordance with this Section XV to perform the Work.

B. Full Surety shall be established as follows:

1. As soon as practicable, but not later than ten (10) business days after the effective date of this Consent Decree, Cotter shall establish:

a. An interest bearing escrow account subject to review and approval by the State for the purpose of providing to the State financial surety for all costs of the Work, including capital costs, but excluding operations and maintenance costs, in the amount of four million seven hundred twenty-seven thousand six hundred forty-one dollars (\$4,727,641.00), and Cotter shall be entitled to withdraw funds from the account pursuant to Paragraph C(1), below, for performance of the Work as such funds may be necessary for capital costs, but excluding operations and maintenance costs; and

b. An interest bearing escrow account subject to review and approval by the State for the purpose of providing to the State financial surety for the operations and maintenance costs of the Work, but excluding capital costs; which account, for the first two (2) years after the effective date of this Consent Decree, shall be in the amount of five hundred sixty-nine thousand eight hundred fifty-six dollars (\$569,856.00); and Cotter shall be entitled to withdraw funds from the account pursuant to Paragraph C(1), below, for performance of the Work as such funds may be necessary for operations and maintenance costs, but excluding capital costs.

2. As soon as practicable, but not later than two (2) years after the effective date of this Consent Decree, Cotter shall deposit in the escrow account established

pursuant to Paragraph B(1)(b) of this Section an additional amount currently estimated as five million seven hundred ninety-eight thousand nine hundred fifty-four dollars (\$5,798,954.00) for the purpose of providing to the State financial surety for the operations and maintenance costs, but excluding capital costs, for the remainder of the Work, and Cotter shall be entitled to withdraw funds from the account pursuant to Paragraph C(1), below, for performance of the Work as such funds may be necessary for operations and maintenance costs, but excluding capital costs. The additional amount shall be subject to review and approval by the State.

3. Not later than two (2) years after the effective date of this Consent Decree, Cotter shall provide and maintain Full Surety.

4. The interest earned on the accounts established pursuant to Paragraph B(1) shall remain credited to the accounts as necessary to establish and maintain Full Surety.

5. Notwithstanding the provisions of Paragraphs B(8) and C below, the amounts in the escrow accounts established pursuant to Paragraph B(1) above shall not be less than two hundred fifty thousand dollars (\$250,000.00).

6. a. Within sixty (60) days following the second anniversary of the effective date of this Consent

Decree and within sixty (60) days following each subsequent annual anniversary of the effective date of the Consent Decree, as an alternative to the obligations imposed upon Cotter pursuant to Paragraphs B(1) and B(2), above, either Party may propose to the other Party a surety arrangement acceptable to the State for the purpose of providing Full Surety to the State in the form of:

(i) A bond issued by a fidelity or surety company with provisions and for a term and amount acceptable to the State;

(ii) A letter of credit issued by a recognized financial institution whose financial condition and commitment are established to the satisfaction of the State;

(iii) A cash bond posted by Cotter with provisions and for a term and amount acceptable to the State; or

(iv) Other financial surety arrangement or combination thereof acceptable to the State.

b. Within sixty (60) days following the receipt of a proposal for an alternative surety arrangement, the receiving Party shall notify the proposing Party of its agreement or disagreement with the proposal and shall specify its reasons for disagreement, if any. If the Parties are in agreement, Cotter shall implement the alternative surety arrangement. If the Parties do not agree, the Parties shall

proceed pursuant to the dispute resolution provisions of Sections XII and XIII. If the Special Master or the Court is asked to resolve such a dispute, the Special Master or the Court shall determine whether the proposed alternative surety arrangement is reasonably available and financially practical under the then-existing circumstances.

c. The obligations imposed upon Cotter pursuant to Paragraphs B(1) and B(2), above, shall remain in full force and effect until such time as an alternative surety arrangement is in full force and effect, and the Consent Decree is amended pursuant to Section XXIII(B).

7. The escrow accounts established pursuant to Paragraph B(1) shall be with an independent third-party agent selected by Cotter and approved by the State. Cotter shall give preference to a third-party agent in Colorado. The agent shall discharge his duties with respect to the escrow accounts in the interest of providing to the State financial surety for all costs of the Work, and Cotter shall be entitled to withdraw funds from the accounts for performance of the Work pursuant to Paragraph C(1), below. The agent shall discharge his duties with the care, skill, prudence and diligence under the circumstances then prevailing which persons of prudence, acting in a like capacity and familiar with such matters, would use in the conduct of an enterprise of a like character and with like aims. The agent shall provide quarterly



statements to the Parties regarding the status of the escrow accounts. Administration of the escrow accounts shall be subject to the terms and conditions of this Consent Decree, and the escrow accounts shall be subject to annual audit by the State for compliance with the terms and conditions of this Consent Decree.

8. Cotter shall be entitled to the withdrawal of funds from the escrow accounts pursuant to Paragraph C(1) below. Unless otherwise authorized by this Section XV, no withdrawal shall be permitted if such withdrawal will reduce the amount of the escrow accounts below that required to maintain Full Surety.

C. 1. Cotter shall only be entitled to withdraw funds from the escrow accounts established pursuant to Paragraph B as follows:

a. Cotter may only withdraw funds from the escrow account established pursuant to Paragraph B(1)(a) to pay the reasonable and necessary capital costs incurred for Work satisfactorily performed;

b. Cotter may only withdraw funds from the escrow account established pursuant to Paragraph B(1)(b) to pay the reasonable and necessary operations and maintenance costs for Work satisfactorily performed;

c. For each requested withdrawal, by the 5th of each month, Cotter shall submit a written statement to

the State and the independent escrow agent for Work performed. The statement shall identify with specificity the Work performed, the cost incurred for each element of the Work performed and the account from which the withdrawal is requested. At the State's request, Cotter shall also make all supporting documentation available to the State for its review;

d. The State shall review the statement by the 15th of the month. If the State does not notify Cotter and the independent escrow agent of any disapproval of the requested withdrawal by the 15th of the month, within two (2) business days thereafter the independent escrow agent shall transfer the funds requested, subject to the requirements for retainage of Paragraph C(1)(e) below, from the escrow account(s) to Cotter. If the State notifies Cotter and the independent escrow agent of any disapproval of the requested withdrawal, the Parties shall proceed with dispute resolution with regard to that specific disapproval before the Special Master pursuant to Sections XII and XIII. The portion(s) of the requested withdrawal that is not subject to the disapproval shall be timely transferred to Cotter pursuant to this Paragraph C(1)(d). In the event of a dispute, Cotter shall only be entitled to withdraw funds from the escrow accounts pursuant to agreement of the Parties or a favorable order from the Special Master or the Court, and the Special

Master shall rule on the subject matter of the dispute by the end of the subject month; and

e. (i) The independent escrow agent shall deduct and retain in the escrow accounts ten percent (10%) of any amount requested and authorized to be withdrawn pursuant to this Paragraph C(1).

(ii) Upon the completion of a component of the Work, Cotter shall submit its final construction report or other final report to the State pursuant to the applicable provisions of the RAP. At the same time, Cotter shall also submit a request for withdrawal of funds retained pursuant to Paragraph C(1)(e)(i), above, for that component of the Work completed specifying the amount of funds requested, the basis for its calculation, the account from which the withdrawal is requested and a description of the completed Work. In addition to its other rights and obligations specified in the Consent Decree, the State shall review the final construction report or other final report and the withdrawal request within the time periods specified in the applicable provisions of the RAP to determine and notify Cotter and the escrow agent whether the requested funds retained in the escrow accounts pursuant to Paragraph C(1)(e)(i), above, may be withdrawn by Cotter. Within two (2) business days of notification that the funds may be withdrawn, the escrow agent shall transfer the funds to Cotter.

(iii) For the components of the Work for which no final construction report or other final report is required by the RAP, Cotter shall submit with the annual report required by the RAP a request for withdrawal of funds retained pursuant to Paragraph C(1)(e)(i), above, for the Work completed specifying the amount of funds requested, the basis for its calculation, the account from which the withdrawal is requested and a description of the completed Work. The State shall have sixty (60) days from its receipt of the withdrawal request to determine and notify Cotter and the escrow agent whether the requested funds retained in the escrow accounts pursuant to Paragraph C(1)(e)(i), above, may be withdrawn by Cotter. Within two (2) business days of notification that the funds may be withdrawn, the escrow agent shall transfer the funds to Cotter.

(iv) If the State notifies Cotter and the escrow agent of any disapproval of withdrawals requested pursuant to Paragraphs C(1)(e)(ii) and (iii), above, the State shall include a detailed description of its reasons for such disapproval with its notification and the Parties shall proceed with dispute resolution pursuant to Sections XII and XIII. In the event of a dispute, Cotter shall only be entitled to withdraw the requested funds from the escrow accounts pursuant to agreement of the Parties or pursuant to a favorable order from the Special Master or the Court, and the

Special Master shall rule on the subject matter of the dispute within thirty (30) days of the initiation of dispute resolution.

f. Subject only to Paragraph C(1)(g) below, Cotter shall only be permitted to withdraw funds from the escrow accounts established pursuant to Paragraph B, above, if the accounts contain, and will contain after the withdrawal, sufficient funds to maintain Full Surety. If, at any time, the State determines that the accounts do not contain sufficient funds to maintain Full Surety, the State shall notify Cotter and the independent escrow agent of the additional amounts necessary to maintain Full Surety and the State shall specify the basis for its determination. Within ten (10) days of receipt of such notification, Cotter shall either notify the State that Cotter disputes the State's determination, or Cotter shall deposit in the accounts the additional sums necessary to maintain Full Surety. If Cotter disputes the State's determination, the Parties shall proceed with dispute resolution before the Special Master pursuant to Sections XII and XIII. In the event of a dispute, Cotter shall only be entitled to withdraw funds from the escrow accounts pursuant to agreement of the Parties or a favorable order from the Special Master or the Court, and the Special Master shall rule on the subject matter of the dispute within fourteen (14) days of the beginning of dispute resolution or by the end of the then-current month, whichever is later.

g. During the first two (2) years following the effective date of this Consent Decree, Cotter may withdraw funds pursuant to this Paragraph C(1) from the escrow account established pursuant to Paragraph B(1)(b), provided that:

(i) such account contains, and will contain following the deposit specified in Paragraph C(1)(g)(ii) below, sufficient funds to maintain financial surety for the operations and maintenance costs of the Work for the first two (2) years, and

(ii) within thirty (30) days of any withdrawal, Cotter deposits funds into such account in the same amount as said withdrawal for the purpose of maintaining the balance of such account at not less than five hundred sixty-nine thousand eight hundred fifty-six dollars (\$569,856.00) for the first two (2) years.

2. Subject to Paragraph C(2)(e), in the event that the State is authorized by the other provisions of this Consent Decree to withdraw funds from one or both of the escrow accounts established pursuant to Paragraph B, above, the following procedures shall apply to such withdrawal:

a. The State may only withdraw funds from the escrow account established pursuant to Paragraph B(1)(a) to pay the reasonable and necessary capital costs;

b. The State may only withdraw funds from the escrow account established pursuant to Paragraph B(1)(b) to pay the reasonable and necessary operations and maintenance costs;

c. The State shall submit a statement to Cotter and the independent escrow agent which identifies the amount requested, a specific description of the activities undertaken or expenses incurred for activities to be undertaken for which the funds are needed and the account from which the withdrawal is requested;

d. Within two (2) business days of receipt by the escrow agent of the State's statement, the escrow agent shall transfer the requested funds to the State;

e. Cotter may initiate dispute resolution pursuant to Sections XII and XIII for the purposes specified in Section VI(A)(1). Pursuant to Section VI, such dispute resolution shall not operate as a stay of Cotter's rights or obligations or the State's rights or obligations under this Consent Decree; and

f. Funds obtained by the State pursuant to this Section XV, if not used to directly pay expenses incurred by the State, shall be deposited in the "Hazardous Substance Response Fund," established pursuant to Colorado Revised Statutes sec. 25-16-104.6 for use as authorized by this Consent Decree.

3. In the event that the State intends to undertake or has undertaken any activities pursuant to Section VI(A)(1) and the State has elected to obtain funds pursuant to Section XV(D), below, the activities of the State shall be subject to the review of the Special Master as specified in this Consent Decree. If Cotter is authorized by the Special Master to undertake all or a portion of such activities, such action shall be without prejudice to the rights of either Cotter or the State to seek appropriate relief from the Special Master or the Court pursuant to the provisions of this Consent Decree.

D. If the State determines that a condition at or from the Mill Facility or Impacted Areas may present an imminent and substantial endangerment to the public health, welfare, or the environment, it shall be entitled to obtain monies from the accounts established pursuant to this Section XV as follows:

1. The State shall submit a written demand to Cotter, the independent escrow agent and the Special Master signed by the Attorney General and the Executive Director of CDH or their duly designated representatives, which demand identifies: (a) the facts upon which the State bases its determination that an imminent and substantial endangerment to the public health, welfare or the environment may be presented; (b) the Work and/or additional actions appropriate



to eliminate, correct or mitigate the endangerment; and  
(c) the estimated costs necessary to the State's performance of the Work and/or additional appropriate actions to eliminate, correct or mitigate the endangerment;

2. If, within forty-eight (48) hours of receipt of the State's written demand, Cotter has not acted or has not agreed to act in a manner acceptable to the State, to eliminate, correct or mitigate the alleged endangerment, the State shall so notify the independent escrow agent who shall allow the State to withdraw funds from the escrow accounts established pursuant to Paragraph B(1) above. The State shall withdraw such funds pursuant to the provisions of Paragraph C(2) above; provided that, the State shall not be allowed to withdraw in excess of an aggregate of two hundred fifty thousand dollars (\$250,000.00) from said accounts during the first fifteen (15) business days following issuance of the State's written demand;

3. Dispute resolution before the Special Master pursuant to Sections XII and XIII shall immediately commence upon the issuance by the State of a written demand pursuant to Paragraph D(1) above. If Cotter disputes the State's determination that an imminent and substantial endangerment to the public health, welfare, or the environment may be presented, then within five (5) business days of the issuance of a written demand pursuant to Paragraph D(1) above,

the Special Master shall rule whether condition(s) may present an imminent and substantial endangerment to the public health, welfare or the environment. If Cotter does not dispute the State's determination that an imminent and substantial endangerment to the public health, welfare or the environment may be presented, or if the Special Master rules that condition(s) may present an imminent and substantial endangerment to public health, welfare or the environment, but Cotter disputes the State's proposed Work and/or the State's proposed additional actions to eliminate, correct or mitigate the endangerment, then within ten (10) business days thereafter the Special Master shall determine the nature and extent of the Work or other appropriate actions to eliminate, correct or mitigate the endangerment. At the same time, the Special Master shall also determine the period of time within which Cotter shall be given an opportunity to immediately initiate and perform the Work or other actions, failing which the State shall be allowed to withdraw funds from the escrow accounts or other surety established pursuant to Paragraph B above. The State shall withdraw such funds pursuant to the provisions of Paragraph C(2) above; and

4. If the Special Master or the Court have not determined (i) whether an imminent and substantial endangerment to the public health, welfare and environment may exist, and/or (ii) the nature and extent of the Work or other

appropriate actions to eliminate, correct or mitigate the endangerment pursuant to Paragraph D(3) above within thirty (30) days of the State's written demand pursuant to Paragraph D(1) above, the State shall be entitled to withdraw funds from the escrow accounts or other surety established pursuant to Paragraph B above. The State shall withdraw such funds pursuant to Paragraph C(2) above.

E. Following the conclusion, favorable to the State, of any dispute resolution proceeding pursuant to Sections XII and XIII in which the State alleged that Cotter failed to comply with any of its obligations imposed by this Consent Decree, and after Cotter has had a subsequent opportunity to immediately initiate and perform the obligations imposed by the Consent Decree, the State shall be entitled to an order authorizing the State to withdraw the sums determined necessary to the State's performance of all or part of the Work and/or appropriate remedial, corrective or mitigative actions from the escrow accounts or other surety established pursuant to Paragraph B, above. The State shall withdraw such funds pursuant to Paragraph C(2), above.

F. The financial surety established pursuant to this Section shall be in addition to, and not in lieu of, financial surety and long-term care requirements of the Colorado Radiation Control Act and regulations promulgated thereunder. The State shall minimize any unnecessary

duplication of the financial surety established pursuant to this Section and that posted pursuant to the financial surety and long-term care requirements of the Colorado Radiation Control Act and the regulations promulgated thereunder.

G. Upon determination by the State that the completion of the Work is acceptable in accordance with Section V above and Section XXX, Cotter shall be released from its obligations to provide financial surety as described in this Section.

H. In the event the State obtains monies from the escrow accounts or other financial surety established pursuant to this Section to perform all or part of the Work and/or appropriate remedial, corrective or mitigative actions, the State shall provide Cotter, three (3) months after initiation of the actions, and for every three (3) month period thereafter until completion, with an accounting of expenditures and shall, upon completion, provide Cotter or the independent escrow agent, as appropriate, all unexpended monies, if any.

I. 1. The amount of the escrow accounts or other surety required by this Section XV may be adjusted upward or downward as current circumstances, including inflation or deflation, changes in the Work, completion of components of the Work, activities performed and to be performed and any other conditions affecting the Work, may require.

2. Unless otherwise authorized by this Section XV, the amount of the escrow accounts or other surety required by this Section XV shall at no time be less than the amount required to maintain Full Surety, and any amounts used pursuant to this Consent Decree shall be replaced by Cotter as needed to maintain Full Surety.

3. Unless otherwise authorized by this Section XV, the amount of the escrow accounts or other surety required by this Section XV, their adequacy and the terms and conditions of any applicable surety instrument provided pursuant to this Section XV shall be reviewed no more than once annually by the State. Such review may be upon application by Cotter or on the initiative of the State. If the State's review occurs pursuant to Cotter's application, the State shall act upon such application within sixty (60) days of receipt of the application. Each determination by the State based on its annual review of the amount necessary to maintain Full Surety, the terms and conditions of any applicable surety instrument, and adequacy of the escrow accounts or other surety required by this Section XV, together with the underlying calculations and rationale, shall be served by mail upon Cotter. Each such determination shall be final and binding upon the Parties, and Cotter shall have sixty (60) days from its receipt of the State's determination in which to adjust the escrow accounts or other surety

required by this Section XV, unless Cotter invokes the dispute resolution provisions of Sections XII and XIII above within ten (10) days after receipt of the State's determination. If following dispute resolution, or if at the end of the above-stated sixty (60) day period when Cotter does not invoke dispute resolution, Cotter then fails or refuses to provide or maintain Full Surety, the State shall be entitled, upon filing of a sworn certificate of such failure with this Court, to a writ of execution for the entire amount required to maintain Full Surety.

**XVI. ENFORCEMENT**

A. In the event either Party breaches any term or condition of this Consent Decree, the nonbreaching Party may seek appropriate relief pursuant to the contempt powers of this Court through the procedures established in Sections XII and XIII.

B. Subject to the limitations of Section XIV, the provisions of Section XVI (A) above shall not limit the ability of the State to institute enforcement proceedings for any asserted violations of federal, state and local statutes, regulations, ordinances, licenses and permits.

**XVII. STIPULATED PENALTIES**

A. Subject to the "force majeure" provisions of Section IX above, in the event Cotter violates the following provisions of this Consent Decree, it shall pay to the State a stipulated civil penalty for each day of each such violation in the following specific amounts:

1. One thousand dollars (\$1,000) per day for calendar days thirty-one (31) through forty-five (45), and two thousand five hundred dollars (\$2,500) per day for calendar days forty-six (46) through sixty (60), and five thousand dollars (\$5,000) per day for each succeeding calendar day for which Cotter fails to timely submit a proposal, plan, report or other submittal pursuant to this Consent Decree;

2. Five thousand dollars (\$5,000) for the first calendar day and ten thousand dollars (\$10,000) per each succeeding calendar day for which Cotter fails to grant access to the State pursuant to Section XI(A) above;

3. One thousand dollars (\$1,000) per day for calendar days one (1) through seven (7) inclusive, and two thousand dollars (\$2,000) per day for calendar days eight (8) through thirty (30) inclusive, and four thousand dollars (\$4,000) per day per each succeeding calendar day for which Cotter fails to perform ground water monitoring pursuant to Section 15 of the RAP; provided that, the penalty shall only apply if two (2) or more consecutive monitoring samples per

well or a total of three (3) or more monitoring samples per well in any one calendar year are not collected pursuant to Section 15 of the RAP;

4. One thousand dollars (\$1,000) per day for calendar days one (1) through seven (7) inclusive, and two thousand dollars (\$2,000) per day for calendar days eight (8) through thirty (30) inclusive, and four thousand dollars (\$4,000) per day for each succeeding calendar day for which Cotter fails to perform the piezometer monitoring pursuant to Section 4 of the RAP; provided that, the penalty shall only apply if two (2) or more consecutive monitoring samples per piezometer or a total of three (3) or more monitoring samples per piezometer in any one calendar year are not collected pursuant to Section 4 of the RAP;

5. One thousand five hundred dollars (\$1,500) per day for calendar days one (1) through seven (7) inclusive, and three thousand dollars (\$3,000) per day for calendar days eight (8) through thirty (30) inclusive, and six thousand dollars (\$6,000) per day per each succeeding calendar day for which Cotter fails to operate the withdrawal wells pursuant to Section 4 of the RAP; provided that, if a withdrawal well has not operated because of an inoperable pump, the penalty shall only apply if the withdrawal well has not operated because of an inoperable pump for the previous consecutive one hundred and twenty (120) or more hours or for a total of four hundred



and eighty (480) or more hours in any one calendar year; and further provided that, if a withdrawal well has not operated because it is nonfunctional (e.g., broken casing, plugged screen or other similar causes), the penalty shall only apply if the withdrawal well has not operated because it is nonfunctional for the previous consecutive thirty (30) or more days or for a total of sixty (60) or more days in any one calendar year;

6. Two thousand five hundred dollars (\$2,500) per day for each day that any one (1) pump at the Soil Conservation Service hydrologic barrier is not operated as required to be operated pursuant to Section 9 of the RAP, five thousand dollars (\$5,000) per day for each day that any two (2) pumps at the Soil Conservation Service hydrologic barrier are not operated as required to be operated pursuant to Section 9 of the RAP, and ten thousand dollars (\$10,000) per day for each day that any three (3) pumps at the Soil Conservation Service hydrologic barrier are not operated as required to be operated pursuant to Section 9 of the RAP; provided that, the penalty shall only apply if the pump(s) is not operated for the previous consecutive one hundred and twenty (120) or more hours or for a total of four hundred eighty (480) or more hours during the calendar year;

7. One thousand five hundred dollars (\$1,500) per day for calendar days one (1) through seven (7) inclusive,

and three thousand dollars (\$3,000) per day for calendar days eight (8) through thirty (30) inclusive, and six thousand dollars (\$6,000) per day per each succeeding calendar day for which Cotter fails to operate the Section 9/16 hydraulic barrier pursuant to Section 8 of the RAP; provided that, if an injection well is not operated as required to be operated pursuant to Section 8 of the RAP because of an inoperable pump, the penalty shall only apply if an injection well is not operated as required to be operated because of an inoperable pump for the previous consecutive one hundred twenty (120) or more hours or for a total of four hundred eighty (480) or more hours in any one calendar year; and further provided that, if an injection well is not operated as required to be operated pursuant to Section 8 of the RAP because it is nonfunctional (e.g., broken casing, plugged screen, or other similar causes), the penalty shall only apply if an injection well is not operated as required to be operated because it is nonfunctional for the previous consecutive thirty (30) or more days or for a previous sixty (60) or more days in any one calendar year;

8. Two thousand five hundred dollars (\$2,500) per day for each calendar day for which Cotter fails to perform its obligations pursuant to Paragraph 7 of Section 13.4 of the RAP; and

9. Two thousand five hundred dollars (\$2,500) per day for each calendar day for which Cotter fails to perform the sample collection described in the study plan required by Paragraph 2 of Section 32.3 of the RAP.

B. The State shall use its best efforts to promptly notify Cotter if it knows or has reason to know that a violation pursuant to Paragraph A has occurred. Any failure of the State to promptly notify Cotter pursuant to this Paragraph shall not operate as a waiver of any stipulated penalty, shall not be a legal or equitable defense in any stipulated penalty proceeding, and shall not operate as a waiver or estoppel of the State's other rights and obligations under this Consent Decree.

C. The stipulated penalties set forth in Paragraph A of this Section shall be paid within ten (10) days of Cotter's receipt of a written demand from the State for payment of such penalties unless Cotter has invoked, in writing, the formal dispute resolution provisions of Sections XII and XIII prior to the deadline for payment. The demand required by this Paragraph shall be served upon Cotter by certified mail and shall describe the provisions allegedly violated, the facts constituting the alleged violation(s) and the date(s) on which such violation(s) allegedly occurred. Payment of the penalties set forth in this Section shall be by certified check made to the order of "Treasurer, State of

Colorado" tendered to the Office of the Colorado Attorney General for payment into the "Hazardous Substance Response Fund" established by Colorado Revised Statutes sec. 25-16-104.6 (Supp. 1986).

D. In the event that the State demonstrates a pattern of violations by Cotter of other provisions of this Consent Decree, the State may petition the Court for establishment of a schedule of future penalties or any other sanctions which the Court may deem appropriate.

E. The Parties agree and the Court hereby finds that the provisions of this Section, which are designed to protect the public health, welfare and environment by deterring significant violations of this Consent Decree, are integral and essential to both the Parties' desire and the Court's order that the provisions of this Consent Decree be, to the maximum extent achievable, self-executing and self-enforcing. The Parties agree and the Court hereby orders that the stipulated penalties described in Paragraph A of this Section are not to be suspended in whole or in part. Cotter agrees and the Court hereby finds that Cotter has waived all rights it may have to contest the amount or imposition of the stipulated penalties described in Paragraph A of this Section, subject only to the affirmative defense that the event(s), conduct, or circumstance(s) giving rise to the alleged violation described in the State's demand did not in fact

occur, which affirmative defense may be raised only by filing with the Court and Special Master and serving upon the State, a written petition for formal dispute resolution pursuant to Section XII(C) within ten (10) days of service of the State's demand pursuant to Paragraph C of this Section. Cotter's petition shall set forth the factual basis upon which it asserts the affirmative defense provided herein. If Cotter timely files such a petition, all stipulated penalties not specifically rejected by the adjudication dispute resolution process shall be paid on or before the tenth (10th) day following final resolution of the dispute pursuant to Sections XII and XIII of this Consent Decree.

F. Upon tender of any stipulated penalty pursuant to this Section and acceptance thereof by the State, Cotter shall be deemed to have been subject to a civil enforcement action by the State for that violation and shall not thereafter be subject to any additional civil penalty or other sanction by the State for that violation. However, nothing herein shall be deemed to limit or preclude the State from seeking, or any Court of competent jurisdiction from granting, appropriate injunctive relief to compel compliance or remedial, corrective or mitigative action pursuant to applicable law and/or provisions of this Consent Decree.

G. Failure to pay the penalties as and when due pursuant to this Section shall entitle the State to a writ of execution for the full amount then due and owing.

XVIII. RESPONSE COSTS AND DAMAGES

A. 1. As soon as practicable, but not later than ten (10) business days after the effective date of this Consent Decree, Cotter shall pay to the State four million two hundred thousand dollars (\$4,200,000) by certified check or other form of guaranteed funds. The check shall be made payable to the order of the "Treasurer, State of Colorado" and shall be tendered to the Office of the Attorney General for distribution into appropriate funds.

2. The payment by Cotter pursuant to this Section XVIII(A) is solely for:

a. Response costs, including costs of litigation and attorneys' fees, incurred by the State prior to the effective date of this Consent Decree excluding License renewal and inspection fees pursuant to the Colorado Radiation Control Act and regulations promulgated thereunder;

b. Costs of the State to oversee the Work pursuant to Section VII above following the effective date of this Consent Decree, provided that, subject to the provisions of Section VII(A), such costs shall not be deemed to include fees and costs pursuant to other federal, state and local statutes, regulations, ordinances, licenses and permits;

c. Alleged damages or damages that could have been alleged as of the effective date of this Consent Decree arising out of all matters which were raised in this

litigation relating to or arising from the Mill Facility or Impacted Areas for injury to, loss of, or destruction of natural resources; and

d. Costs of remedial actions undertaken by the State pursuant to Section 31 of the RAP.

3. The Parties agree and the Court hereby orders that the four million two hundred thousand dollars (\$4,200,000) paid pursuant to Section XVIII(A) above shall be distributed by the State pursuant to Appendix C attached hereto.

B. Within one (1) year after the effective date of this Consent Decree, Cotter shall pay to the State an additional two hundred fifty thousand dollars (\$250,000) by certified check or other form of guaranteed funds. The check shall be made payable to the order of the "Treasurer, State of Colorado" and shall be tendered to the Office of the Attorney General for distribution to the General Fund of the State as recovery related to the enforcement of the Colorado Hazardous Waste Management Act, Colorado Revised Statutes secs. 25-15-101 to -313 (Supp. 1986).

**XIX. MUTUAL RELEASE AND COVENANT NOT TO SUE**

A. Except as specifically provided in Paragraphs C and D below, upon compliance by Cotter with Section XVIII above and posting of the surety provided in Section XV above,

the State hereby releases and covenants not to sue Cotter as to all:

1. Common law claims;
2. Civil, state and federal statutory claims and causes of action under provisions of CERCLA and other environmental statutes and/or regulations and/or other environmental laws administered and enforced by the State or available to be asserted by the State; and
3. Claims by the State for natural resource damages within the State,

which claims listed in the immediately preceding Subparagraphs (1), (2), and (3) have been, or could have been asserted against Cotter as of the effective date of this Consent Decree, arising out of all matters which were raised in this litigation relating to or arising from the Mill Facility or Impacted Areas, and further arising out of all matters whether or not raised in this litigation that concern or relate to all spent catalyst materials at the Mill Facility or Impacted Areas.

B. Upon the release and covenant not to sue by the State described above, Cotter hereby releases and covenants not to sue the State as to all:

1. Common law claims;



2. Civil, state and federal claims and causes of action under provisions of CERCLA and other environmental statutes and/or regulations; and

3. Claims for monetary damages, which claims listed in the immediately preceding Subparagraphs (1), (2), and (3) have been, or could have been asserted against the State as of the effective date of this Consent Decree, arising out of all matters which were raised in this litigation relating to or arising from the Mill Facility or Impacted Areas, and further arising out of all matters whether or not raised in this litigation that concern or relate to all spent catalyst materials at the Mill Facility or Impacted Areas.

C. This mutual release and covenant not to sue shall not apply to the following:

1. Failure to perform the Work in accordance with or failure to meet the requirements of this Consent Decree;

2. Violations of applicable federal, state and local statutes, regulations, ordinances, licenses, permits, approvals and consents, provided, however, that Cotter shall only be required to obtain State permits pursuant to Section XIV(F);

3. Any person or entity not a Party to this Consent Decree;

4. Any liability under federal, state and local statutes, regulations, ordinances, and the common law arising from the off-site disposal of waste originating at or from the Mill Facility or Impacted Areas;

5. Complaints, cross-claims, counterclaims, and/or third-party complaints between the State and Cotter in, or arising out of, any private action brought by any private (nongovernmental) person or entity not a Party to this litigation;

6. Any costs incurred by the State as a result of the exercise of its response authority under federal, state or local statutes, regulations, ordinances or the common law due to a release or substantial threat of a release at or from the Mill Facility or Impacted Areas as a result of the failure of Cotter to perform the Work or meet the requirements of this Consent Decree whenever Cotter has failed to undertake such response after reasonable notice;

7. Any damages incurred by the State as a result of any release or substantial threat of release of hazardous substances at or from the Mill Facility or Impacted Areas which results from failure(s) of Cotter to perform the Work or meet the requirements of this Consent Decree;

8. Cotter's rights under state law to administrative and/or judicial review of State action relating to the issuance, denial or modification of any license or permit, except as such rights have been waived as provided in Section XIV in this Consent Decree; and

9. The right of Cotter to seek contribution from the State in the event of the filing of a suit by the United States for natural resource damages under CERCLA. Nothing in this Consent Decree shall be deemed a waiver of the State's rights, if any, under the Eleventh Amendment to the United States Constitution.

D. Nothing in this Consent Decree shall be construed to limit the authority of the State to undertake any action against Cotter in response to or to recover the costs of responding to conditions at or from the Mill Facility or Impacted Area(s) which may present an imminent and substantial endangerment to the public health, welfare or the environment resulting from or in connection with:

1. Either the occurrence and/or discovery after execution by the Parties of this Consent Decree of:
  - a. previously unknown or undetected conditions at or from the Mill Facility or Impacted Areas; or

b. other previously unknown or new facts;  
or

c. scientific knowledge regarding the  
toxicity of conditions at the Mill  
Facility or Impacted Areas; or

2. Conditions caused by the implementation of  
this Consent Decree;

provided, however, that the State has first made a good faith  
effort to provide Cotter with the opportunity to implement a  
response to such conditions, which response is both timely and  
appropriate in the opinion of the State.

#### XX. RESERVATION OF RIGHTS

The Parties reserve the right to assert claims and  
defenses against any nonparties to this Consent Decree,  
including the United States, and without limitation, the right  
to seek payment, reimbursement or contribution from nonparties  
to this Consent Decree for actions taken or to be taken under  
this Consent Decree or otherwise.

#### XXI. INDEMNIFICATION

Cotter agrees to indemnify the State from all claims  
by nonparties to this Consent Decree arising from the acts or  
omissions of Cotter and its agents, Contractors and  
subcontractors in performing or failing to perform the Work or

other remedial, corrective or mitigative actions required by this Consent Decree. For purposes of this Section XXI only, "nonparties to this Consent Decree" shall include directors and employees of the State. This indemnification does not extend to that portion of any such claim or cause of action attributable to the negligent acts or omissions or intentional misconduct of the State or its agents or consultants.

**XXII. COMMUNICATIONS AND NOTICES**

A. The OSC shall notify each of the following agencies of his/her appointment as OSC. Communications between each of the following agencies and Cotter with respect to implementation of the Work shall be made so as to include the OSC:

Office of Health Protection  
Colorado Department of Health

Water Quality Control Division  
Colorado Department of Health

Radiation Control Division  
Colorado Department of Health

Air Quality Control Division  
Colorado Department of Health

Division of Wildlife  
Colorado Department of Natural Resources

Mined Land Reclamation Division  
Colorado Department of Natural Resources

Colorado Geological Survey  
Colorado Department of Natural Resources

Division of Water Resources  
Office of the State Engineer  
Colorado Department of Natural Resources

United States Environmental Protection Agency

United States Nuclear Regulatory Commission

and any other governmental entity which becomes involved in implementation of the Work.

B. Whenever Cotter receives a notice of an administrative action regarding environmental matters pertaining to the Work which notice does not, on its face, indicate delivery to the OSC, Cotter shall provide the OSC with a copy. The OSC shall contact the sending agency to notify it of his/her role.

C. Except as otherwise provided in this Consent Decree, whenever, under the terms of this Consent Decree, notice is required to be given, or a report or other document is required to be provided, the requirement shall be deemed satisfied upon hand delivery or mailing as evidenced by postmark.

D. Nothing in this Consent Decree is intended to or shall preempt the notification requirements of any applicable federal, state or local statute, regulation, ordinance, license or permit.

E. Whenever, under the terms of this Consent Decree, notice is required to be given, a report or other document is required to be provided by one party to another,

or service of any papers is required, it shall be directed to the following individuals at the addresses specified below:

State:

- (a) Office of the Colorado Attorney General  
CERCLA Litigation Section  
1560 Broadway, Suite 250  
Denver, Colorado 80202  
Attention: Cotter Uranium Mill  
Site Counsel
- (b) Director, Radiation Control Division  
Colorado Department of Health  
4210 East 11th Avenue  
Denver, Colorado 80220
- (c) Cotter Uranium Mill OnSite  
Coordinator  
Colorado Department of Health  
4210 East 11th Avenue  
Denver, Colorado 80220

Cotter:

- (a) Cotter Corporation  
12596 West Bayaud Avenue  
Suite 350  
Lakewood, Colorado 80228  
Attention: Timothy C. Smith
- (b) Holme Roberts & Owen  
1700 Broadway, Suite 1800  
Denver, Colorado 80290  
Attention: Cotter Corporation Counsel  
Canon City Site Documents  
Enclosed
- (c) Cotter Corporation  
Canon City Site Manager  
0502 Fremont County Road 68  
Post Office Box 751  
Canon City, Colorado 81212

The individuals to whom, or addresses to which, notices, reports and service shall be sent may be revised upon written instruction to the other Party.

**XXIII. MODIFICATIONS AND AMENDMENTS**

A. 1. The RAP may be modified by written agreement of the Parties which, in the case of the State, shall require the approval of the Executive Director for CDH with the advice and consent of the Attorney General or their duly designated representatives. If such modification is in any way inconsistent with the provisions of this Consent Decree, then the Parties shall also proceed in accordance with Paragraph B of this Section XXIII.

2. Either Party may unilaterally request a modification of the RAP. Such request shall be presented in writing to the other Party. If the request is denied by the non-requesting Party, the request shall be subject to the dispute resolution provisions of Sections XII and XIII. Any modification of the RAP to which the Parties agree or which has been reached as a result of the dispute resolution provisions of this Consent Decree shall be incorporated into the RAP and shall state its effective date. If such modification is in any way inconsistent with the provisions of this Consent Decree, the Parties shall also proceed in accordance with Paragraph B of this Section XXIII.

B. The Parties may jointly petition the Court in writing for amendment of this Consent Decree. (For purposes of this Paragraph B the term "Consent Decree" does not include the "RAP.") Absent agreement by the Parties, amendment to



this Consent Decree shall be considered by the Court only after the Parties have exhausted the dispute resolution provisions of Sections XII and XIII. No amendment to this Consent Decree shall be granted unless such amendment is reasonably necessary to effectuate the purposes of the negotiated settlement; or to protect the public health, welfare, or the environment; or unless performance of any requirement of this Consent Decree has been rendered impossible by any subsequently enacted, modified or promulgated federal, state or local statute, regulation, ordinance or permit. Any proposed amendment to this Consent Decree determined by the State to be major shall be submitted for the appropriate public comment prior to its entry as an order of the Court. Every amendment to this Consent Decree shall be in writing and approved by Court Order and shall have as its effective date the date as established by the Court.

C. The provisions of this Section XXIII shall not be used to foreclose any rights nonparties to this Consent Decree may have under federal, state or local law to receive public notice, comment on, intervene in, appeal from, or otherwise participate in the modification of the RAP and amendment of the Consent Decree.

**XXIV. NATIONAL CONTINGENCY PLAN AND OTHER LAWS**

A. The Parties agree and the Court finds that the site investigation and analysis of remedial alternatives undertaken by the State with the participation of Cotter, has complied with and is not inconsistent with the requirements of 40 C.F.R. secs. 300.68 and 300.71(a)(2)(A) of the NCP.

B. The Parties agree and the Court finds that the scoping of response actions during the remedial investigation and development and initial screening of alternatives, detailed analysis of alternatives, and selection of the remedy undertaken by the State with the participation of Cotter has complied with and is not inconsistent with the requirements of 40 C.F.R. secs. 300.68 and 300.71(a)(2)(B) of the NCP.

C. The Parties agree and the Court hereby finds that the Work, if properly performed in accordance with this Consent Decree, is the "appropriate extent of remedy" as defined and required by 40 C.F.R. secs. 300.68(i)(1) and 300.71(a)(2)(ii)(C) of the NCP.

D. The Parties agree and the Court hereby finds that the response costs expended and to be expended by the State and Cotter at or relating to the Mill Facility and Impacted Areas are consistent with, and are not inconsistent with, the NCP.

E. The Parties agree and the Court hereby finds that the regulations codified at 40 C.F.R. Part 192 are

legally applicable standards, requirements, criteria or limitations as such are defined pursuant to Section 121, including, but not limited to, Section 121(d), of CERCLA. The activities to be conducted pursuant to the RAP are designed to attain, and if implemented as required by this Consent Decree are expected to attain, and Cotter shall comply with the standards, requirements, criteria and limitations codified at 40 C.F.R. Part 192. For purposes of determining compliance with these regulations, the Parties agree and the Court hereby finds that the concentration limits of hazardous constituents for ground water protection as required by 40 C.F.R. Section 192.32(a)(2) (as that Section incorporates 40 C.F.R. Sections 264.92, 264.93 and 264.94) are those set out in Section 14.1.5 of the RAP and that the compliance point as required by 40 C.F.R. Section 192.32(a)(2) (as that Section incorporates 40 C.F.R. Sections 264.92 and 264.95) is defined in Section 14.1.5 of the RAP. When there is compliance with the standards, requirements, criteria and limitations of Section 121, including, but not limited to, Section 121(d)(2)(B)(ii), of CERCLA and 40 C.F.R. Section 192.32, and the State has considered the factors specified in 40 C.F.R. Section 264.94(b) and (c) and has made a finding that alternate concentration limits will not pose a substantial present or potential hazard to human health or the environment as long as the alternate concentration limits are not exceeded, alternate

concentration limits shall be set. In setting the alternate concentration limits, consideration shall be given to the maximum extent practicable to the purposes, standards and requirements of Section 14 of the RAP.

F. 1. The Parties agree, and the Court hereby finds, that the activities to be conducted pursuant to the RAP are designed to attain, and if implemented as required by this Consent Decree such activities are expected to attain, and Cotter shall comply with all legally applicable or relevant and appropriate standards, requirements, criteria or limitations ("ARARs") as such ARARs are defined pursuant to Section 121, including, but not limited to, Section 121(d) of CERCLA.

2. In addition to the standards, requirements, criteria and limitations referenced in Paragraph E of this Section XXIV, other ARARs may be determined pursuant to Section 121, including, but not limited to, Section 121(d) of CERCLA and are to be found in the following statutes, regulations promulgated pursuant to the following statutes, and the following regulations:

- a. Atomic Energy Act of 1954, 42 U.S.C. secs. 2011 to 2284;
- b. Uranium Mill Tailings Radiation Control Act of 1978, 42 U.S.C. secs. 7901 to 7942;

- c. Colorado Radiation Control Act,  
Colorado Revised Statutes secs.  
25-11-101 to 25-11-305;
- d. Colorado Radiation Control  
Regulations, 6 CCR secs. 1007-1 et  
seq.;
- e. Environmental Radiation Protection  
Standards for Nuclear Power  
Operations, 40 C.F.R. Part 190;
- f. Standards for Owners and Operators of  
Hazardous Waste Treatment, Storage and  
Disposal Facilities, 40 C.F.R. Part  
264, as incorporated in 40 C.F.R. Part  
192;
- g. Safe Drinking Water Act, 42 U.S.C.  
secs. 300f to 300 j-10, as amended by  
Public Law No. 99-339, 100 Stat. 642  
and the Maximum Contaminant Levels and  
Maximum Contaminant Level Goals  
established thereunder;
- h. Colorado Safe Drinking Water  
Authorities, Colorado Revised  
Statutes, secs. 25-1-107(x) and (y),  
25-1-114, and 25-1-114.1 and all

regulations promulgated thereunder, 5  
CCR 1003-1 et seq.;

- i. Federal Water Pollution Control Act,  
33 U.S.C. secs. 1251 et seq. and the  
Water Quality Criteria established  
thereunder;
- j. Colorado Water Quality Control Act,  
Colorado Revised Statutes, secs.  
25-8-101 to 25-8-612 and all  
regulations promulgated thereunder, 5  
CCR secs. 1002-1 to 1002-10 and  
1003-1;
- k. Clean Air Act, 42 U.S.C. secs. 7401 et  
seq.;
- l. Colorado Air Quality Control Act,  
Colorado Revised Statutes, secs.  
25-7-101 to -305 and all regulations  
promulgated thereunder, 5 CCR secs.  
1001 et seq.;
- m. Solid Waste Disposal Act, as amended  
by the Resource Conservation and  
Recovery Act and the Hazardous and  
Solid Waste Amendments of 1984, 42  
U.S.C. secs. 6901 to 6987;
- n. Colorado Hazardous Waste Act, Colorado  
Revised Statutes, secs. 25-15-101 to

-313 and all regulations promulgated thereunder, 6 CCR secs. 1007-3, et seq.;

- o. Colorado Solid Wastes Disposal Act, Colorado Revised Statutes, secs. 30-20-101, et seq.;
- p. Toxic Substances Control Act, 15 U.S.C. secs. 2601, et seq.;
- q. Colorado Mined Land Reclamation Act, Colorado Revised Statutes, secs. 34-32-101, et seq.;
- r. Colorado Ground Water Management Act, Colorado Revised Statutes, secs. 37-90-101, et seq.;
- s. Colorado Water Right Determination and Administration Act of 1969, Colorado Revised Statutes, secs. 37-92-101, et seq.;
- t. Colorado Reservoirs Act, Colorado Revised Statutes, secs. 37-87-101, et seq.; and
- u. Hazardous Materials Transportation Act, 49 U.S.C., secs. 1801, et seq.

G. . Notwithstanding any other provision of this Consent Decree, Cotter shall comply with the applicable

provisions of the Atomic Energy Act of 1954, the Uranium Mill Tailings Radiation Control Act of 1978, the Colorado Radiation Control Act, regulations promulgated pursuant to these statutes, and the License.

**XXV. NATIONAL PRIORITY LIST**

Upon successful completion of the Work, the State shall use its best efforts to assist Cotter to obtain deletion of the Lincoln Park site from the NPL.

**XXVI. EFFECT OF SUBSEQUENTLY ENACTED OR PROMULGATED STATUTES OR REGULATIONS**

A. Except as otherwise provided in this Consent Decree, any reference to a statute or regulation which is made in this Consent Decree is to said statute or regulation in effect as of the date of entry of this Consent Decree.

B. In the event that any Party asserts that a subsequent enactment, amendment or promulgation of any federal, state or local statute, regulation, or ordinance is applicable and if any Party determines that such statute, regulation or ordinance may directly or indirectly impose an obligation which differs from or is inconsistent with any obligation imposed by this Consent Decree, any Party may seek appropriate modification of any Party's obligation(s) pursuant to Section XXIII. Any modification requested pursuant to this



Section shall be subject to the dispute resolution provisions of Sections XII and XIII.

C. In the event any Party seeks a modification of any obligation pursuant to Paragraph B of this Section, Cotter shall proceed in compliance with the Consent Decree, but Cotter may seek a stay of any obligation under the Consent Decree affected by or relating to the requested modification or amendment; provided, however, that no stay shall be granted unless Cotter establishes that its failure to perform any scheduled obligation will not pose an imminent and substantial endangerment to the public health, welfare or environment.

**XXVII. EFFECT OF CONSENT DECREE**

The Parties agree and the Court hereby finds that this Consent Decree in its entirety and all of the obligations imposed hereunder constitute the continuation of an action or proceeding by the State to enforce the State's police and regulatory powers, and the obligations imposed by this Consent Decree, including those which arise pursuant to Section XV, constitute a judgment which was obtained in an action or proceeding by the State to enforce the State's police or regulatory power. The Parties agree and the Court hereby finds that such obligations require performance by Cotter of actions that are reasonably designed to protect the public health, welfare, and environment from identified hazards

which, although it requires the expenditure of money by Cotter, does not constitute a money judgment for purposes of 11 U.S.C. secs. 501 through 1330, and Cotter is estopped from arguing that any portion of this Consent Decree constitutes a money judgment for such purposes.

#### XXVIII. EFFECTIVE DATE

This Consent Decree is to be submitted for public comment for a period of thirty (30) days immediately upon execution by the Parties. A public meeting to receive comments is to be held during the thirty (30) day period. Concurrently, to the extent practicable, the State shall conduct any administrative proceedings necessary under applicable state statutes and regulations to finalize issuance of License Amendment 24. This Consent Decree shall not be entered by the Court until the thirty (30) day comment period expires, all comments received have been duly considered by the Parties and jointly submitted to the Court together with responses and/or mutually agreed amendments to this Consent Decree, modifications to the RAP, and amendments to the License. This Consent Decree and License Amendment 24 shall become effective upon the date of entry of the Consent Decree by the Court.

**XXIX. USE OF CONSENT DECREE**

This Consent Decree has been negotiated and executed by the State and Cotter in good faith to avoid further expensive and protracted litigation and to assure the protection of the public health, welfare and the environment at and near the Mill Facility. This Consent Decree is a settlement of claims which were vigorously contested, denied and disputed as to validity and amount. Execution of this Consent Decree is not an admission of liability or fault as to any issue which has been or could have been raised in this litigation and shall not be so used by any nonparty to this Consent Decree. With respect to any nonparties to this Consent Decree, nothing in this Consent Decree shall constitute any evidence against, admission by, or any estoppel against Cotter or the State with respect to any claim or cause of action arising from any alleged contamination arising from activities at the Mill Facility or Impacted Areas. It is further agreed that the payment to be made by Cotter pursuant to Section XVIII above is not, and does not constitute, a penalty, fine, or monetary sanction of any kind.

**XXX. RETENTION OF JURISDICTION AND TERMINATION OF CONSENT DECREE**

A. This Court shall retain jurisdiction over the Parties and this Consent Decree for purposes of ensuring compliance with its terms and provisions, to hear petitions

pursuant to Sections VI and XVII(D) above, to consider modifications and amendments to this Consent Decree pursuant to Section XXIII, and to resolve disputes as provided in Sections XII and XIII above.

B. When Cotter believes that it has satisfied all of its obligations under this Consent Decree, and that the Work has been satisfactorily completed, it shall petition this Court for termination of this Consent Decree, which shall then terminate, subject to the exceptions stated below, one hundred and eighty (180) days thereafter unless the State objects within that period of time. Any such objection shall be subject to the dispute resolution provisions of Sections XII and XIII. Termination of the Consent Decree shall not affect the provisions of Sections XI(G), XVIII, XIX, XX, XXI, and XXVII.

WHEREFORE, the Parties hereto enter into this Consent Decree and submit it to this Court for approval and entry, subject to the conditions set forth in Section XXVIII above.

DATED this 18th day of February, 1988.

THE STATE OF COLORADO:

Thomas M. Vernon M.D.  
Thomas Vernon, M.D.  
Executive Director,  
Colorado Department of Health

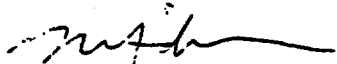
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Denver, Colorado 80202  
(303) 866-4344

DATED this 18<sup>th</sup> day of February, 1988

COTTER CORPORATION

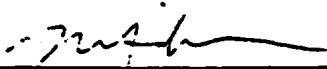
  
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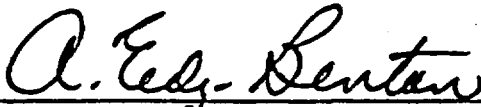
  
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1700 Broadway, Suite 1800  
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(303) 861-7000

DATED this 18<sup>th</sup> day of February, 1988

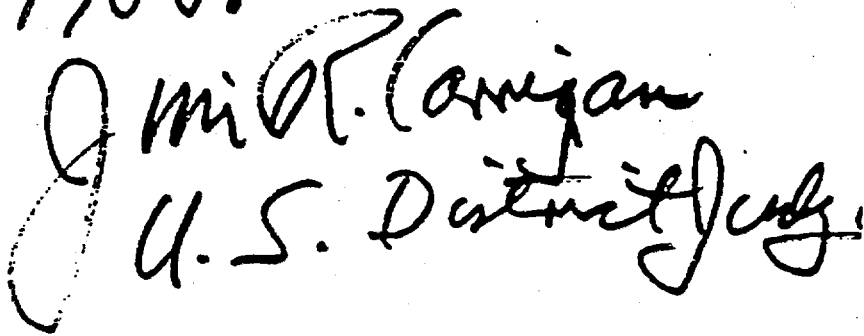
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Approved by the Court  
April 4, 1988.

  
J. M. O'Carroll  
U.S. District Judge

**ATTACHMENT A**

**TO**

**JOINT MOTION FOR ENTRY OF FINAL CONSENT DECREE,  
ORDER, JUDGMENT AND REFERENCE TO SPECIAL MASTER**



IN THE UNITED STATES DISTRICT COURT  
FOR THE DISTRICT OF COLORADO

Civil Action No. 83-C-2389

STATE OF COLORADO,

Plaintiff,

vs.

COTTER CORPORATION, a New Mexico corporation,

Defendant

---

JOINT MOTION FOR ENTRY OF FINAL CONSENT DECREE,  
ORDER, JUDGMENT AND REFERENCE TO SPECIAL MASTER

---

Plaintiff, the State of Colorado (the "State"), and defendant, the Cotter Corporation ("Cotter"), hereby move for entry of the Final Consent Decree, Order, Judgment and Reference to Special Master, as the Court's Order, Judgment and Reference to Special Master.

As grounds for this Motion, the parties state as follows:

1. The parties first lodged their proposed Consent Decree, Order, Judgment and Reference to Special Master with this Court on December 11, 1987, and distributed same for public comment. The 30-day comment period, as extended for two (2) weeks by Order of this Court, expired January 29, 1988.

2. Contemporaneously with the filing of this Joint Motion, the parties file their Final Consent Decree, Order, Judgment and Reference to Special Master, attached as Attachment A to this Motion.

3. The revisions from the proposed settlement that are contained in the Final Consent Decree, Order, Judgment and Reference to Special Master are described here:

a. At page 26, line 13 of the RAP, replace "All" with the following language:

Except for samples collected in accordance with Sections 21 (On-site Soils) and 24 (Site Adjacent Soils), all . . .

b. At page 43, line 17 of the RAP, replace the following language:

"September 30, 1988." with "September 30, 1989."

c. At page 127, line 9 of the RAP, replace the following language:

"December 1, 1988," with "March 1, 1989,"

d. At page 129, line 10 of the RAP, replace the following language:

". . . a designated monitoring well . . ." with "two designated monitoring wells . . . "

e. At page 131, lines 1 and 2 of the RAP, replace the following language:

"two piezometers" with "two to four piezometers"

f. At page 131, lines 3 and 4 of the RAP, insert the following language:

"two wells comprising the" between "the" and "Lincoln Park Monitoring Well"

g. At page 131, line 5 of the RAP, replace the following language:

". . . two wells" with "piezometers"

h. At page 132, line 8 of the RAP, delete the following language:

"two"

i. At page 132, line 15 of the RAP, replace the following language:

". . . the three wells." with "the wells and piezometers."

j. At page 132, line 22 of the RAP, replace the following language:

". . . the three wells." with "the wells and piezometers."

k. At page 133, line 4 of the RAP, insert the following language at the beginning of the paragraph:

"Compliance testing (i.e., comparison to numerical objectives for uranium and molybdenum) shall be performed using the data from each of the two wells comprising the Lincoln Park Monitoring Well separately.

l. At page 133, line 5 of the RAP, replace the following language:

"concentrations" with "measures of flux"

m. At page 133, line 10 of the RAP, immediately following the parenthetical, insert the following language:

"at one of the two wells comprising the Lincoln Park Monitoring Well"

n. At page 133, line 19 of the RAP, replace the following language:

"objective," with "objectives in both of the two wells comprising the Lincoln Park Monitoring Well,"

o. At page 133, line 23 of the RAP, replace the following language:

"objectives," with "objective, in either well,"

p. At page 142, line 11 of the RAP, replace the following language:

"one (1) existing well" with "two (2) existing wells"

q. At page 142, line 14 of the RAP, replace the following language:

"same area" with "same area or one existing well and one new well within the same area"

r. At page 143, line 3 of the RAP, delete the following language:

"Following two (2) years of acceptable monitoring, the State shall select one (1) of the two (2) monitoring wells as the Lincoln Park Monitoring Well. The well not selected shall be grouted closed. Once the Lincoln Park Monitoring Well is approved by the State, . . ."

Insert at the end of that paragraph the following language:

Together, these wells shall be designated, and collectively referred to herein, as the "Lincoln Park Monitoring Well."

s. At page 143, line 16 of the RAP, replace the following:

"Well(s)" with "Wells"

t. At page 143, line 22 of the RAP, replace the following language:

" . . . an existing monitoring well" with "existing monitoring wells"

u. At page 143, line 25 of the RAP, replace the following:

"well(s)" with "wells"

v. At page 144, lines 1 and 2 of the RAP, replace the following language:

" . . . an existing well if use of an existing well is . . ." with "existing wells if the use of existing wells is . . ."

w. At page 145, line 11 of the RAP, replace the following:

" . . . Well(s)." with " . . . Well."

x. At page 146, line 3 of the RAP, delete the following paragraph and renumber the consecutive paragraphs accordingly:

7. The State shall select the Lincoln Park Monitoring Well from the well(s) proposed pursuant to Paragraph 1 of Section 14.2

within ninety (90) days after the receipt of two (2) years of monitoring data.

y. At page 244, line 6 of the RAP, replace the following language:

" . . . methodologies;" with " . . . methodologies, including the proposed name of a volunteer local community representative who will act as a liaison between the panel and the community for the purposes of information exchange between these two groups. (The minimum qualifications of this volunteer local community representative are: resident in the area for no less than three (3) years and medical doctor or Ph.D. in a physical or biological science);

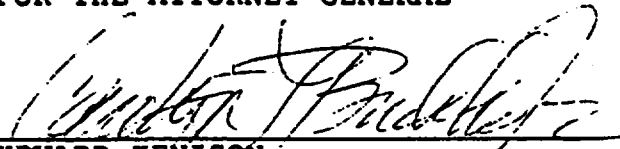
4. The parties have also filed detailed responses to the public comments. The State has filed its responses. Cotter has filed its separate responses.

5. The parties believe and represent to the Court that their agreement, as embodied in Attachment A to this Motion, is a fair, reasonable and equitable settlement of the issues recited therein, and meets all applicable requirements of federal and state law.

WHEREFORE, the parties seek the Court's finding that the terms and provisions of the Final Consent Decree, Order, Judgment and Reference to Special Master, in their entirety, and all documents appended thereto, represent a fair, reasonable, and equitable settlement of all matters which have been raised between the parties to this litigation. The parties also request that this Court enter the Final Consent Decree, Order, Judgment and Reference to Special Master as an Order and Judgment of this Court and that the Court refer disputes to the Special Master as further detailed therein.

DATED this 12th day of February, 1988.

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APPENDIX A

COTTER URANIUM MILL SITE  
REMEDIAL ACTION PLAN

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## 1 INTRODUCTION

Cotter Corporation (Cotter) is a uranium mining and milling company which owns and operates a uranium-vanadium mill near Canon City, Colorado. The Canon City mill facility produces uranium concentrate and recovers molybdenum and vanadium as by products. The Cotter Canon City mill site is located in Fremont County in the south-central part of Colorado, approximately 96 miles south of Denver and approximately 36 miles northwest of Pueblo (see Figure 1-1).

The Cotter mill site lies in a topographic bowl known as the Wolf Park basin and is about 3.5 miles south of Canon City and 2 miles south of Lincoln Park, a semi-rural area. Cotter owns Section 16 and the southern three quarters of the eastern half of Section 9, Township 19 South, Range 70 West, 6th Principal Meridian. This area will be referred to as "the site" or "the mill site" or "the Facility" in the remainder of this document. The site includes approximately 1.4 square miles (880 acres) and contains an inactive mill, an active mill, a partially reclaimed tailings pond disposal area, and an active tailings pond disposal area. The two mills are located in the northwest corner of Section 16. Currently active tailings impoundments and ponds formerly used for tailings disposal cover most of the central area of Section 16. (See Figure 1-2.)

The original mill, now inactive, used an alkaline leach process and was in service from July 1958, when milling operations began at the site, until December of 1979. Tailings from the old alkaline leach mill were disposed in ten unlined and lined tailings ponds. These old tailings ponds were unlined except for pond 2 (lined July 1972), pond 3 (lined approximately June 1981), and pond 10 (lined June 1976). Pond 7 was used for the storage of fresh water. The remaining nine ponds were used for storage of various process liquids and for disposal of tailings (liquid (raffinate) and solid waste material produced by the mill process). During the period April 1981 to August 1983, the tailings contained in the old tailing ponds, together with some of the underlying soils and other materials, were removed and transferred to the secondary impoundment using conventional earthmoving equipment.

Surface water runoff from the site, which occurred prior to the construction of the Soil Conservation Service Flood Control Dam (SCS Dam), represented a pathway for the potential transport of mill derived materials off-site. Surface water flow off the site was changed when the SCS Dam was completed in 1971. Located approximately 4000 feet north of the main tailings impoundment on the site, the dam was built to mitigate the effects of storm-generated floods. By impounding site runoff and springs and seeps, the dam has

isolated surface water on the site from Lincoln Park. Hydrologic and water quality data indicate a shallow ground water pathway beneath the SCS Dam, allowing ground water to migrate from the site to Lincoln Park. The State suspects that other shallow ground water pathways to the northeast and northwest of the SCS Dam may exist.

In September 1979, an acid leach mill commenced operation. All tailings from the mill have been disposed of in the new impoundment. The new impoundment is divided into a 91-acre main impoundment, currently used for storage of the acid leach mill tailings and water collected from ground water interception facilities, and a 44-acre secondary impoundment. These new impoundments were constructed with compacted earthen embankments, compacted clay and synthetic membrane linings, and drains below the clay and membrane liners to reduce hydrostatic uplift. The drains above the membrane liner are intended for use in dewatering the impoundments at mill closure. This Remedial Action Plan (RAP) provides for the construction of facilities designed to collect leakage, if any, from the main and secondary impoundments.

Mill derived constituents found in uranium tailings generated at the site have been released to ground water on site and are present in Lincoln Park, and released to soils on site and certain offsite locations. Data presented in Table 1-1 are representative of ground water quality in the

TABLE 1-1

Ground Water Quality in the Old Tailings Ponds Area

<u>Constituent</u>	<u>Average Concentration In 1986 (mg/l)</u>
Uranium	97.7
Molybdenum	214
Vanadium	<0.050
Selenium	0.30
Chloride	848
Sulfate	17,400
Carbonate	<10

Old Tailings Ponds Area. Tailings material from the site is dispersed by the wind. Values shown in Table 1-2 are representative of the composition of tailings particulates. Wind dispersed tailings material may be a source of surface water impact in drainages adjacent to the site.

The yellowcake dryer, part of the acid leach mill, performs a roasting operation to dry and decompose precipitated ammonium diuranate. Emission controls are currently in place on the yellowcake dryer discharge gases stack. Emissions from the yellowcake dryer stack contain uranium which can be dispersed by wind. This RAP requires that emission controls on the yellowcake dryer stack be Best Available Technology (BAT).

Ore on the site is presently stockpiled approximately 800 to 1000 feet northeast of the mill. Ore is moved from the stockpile area to the ore handling area, which is immediately north of the mill, and is then placed in the ore hopper of the mill. The maximum ore inventory permitted by the radioactive materials license is 200,000 tons. The major economic constituent of ore processed at the Cotter mill is uranium. Ore particulates are dispersed from the site by the wind.

A catalyst plant on the mill site was operated briefly in 1978 and in 1979 to recover metal values from spent

TABLE 1-2

Chemical Analysis of Cotter Alkaline Tailings

<u>Particle Size</u>	<u>As</u>	<u>Cu</u>	<u>Ni</u>	<u>Mo</u>	<u>Se</u>	<u>F</u>	<u>Hg</u>	<u>Pb</u>	<u>U</u>	<u>Zn</u>
>10 microns (64.91%)	0.0053	0.011	0.005	<0.01	0.0006	0.04	0.0023	0.021	0.011	0.022
5-10 microns (4.25%)	0.011	0.026	0.011	<0.01	0.0011	0.08	0.00085	0.063	0.021	0.044
<5 microns (30.84%)	0.0204	0.043	0.020	0.01	0.0011	0.10	0.00093	0.190	0.038	0.060
TOTAL	0.0102	0.022	0.0098	<0.01	0.0008	0.06	0.00047	0.075	0.020	0.035

Values are expressed as percent by weight.

As = Arsenic; Cu = Copper; Ni = Nickel; Mo = Molybdenum; Se = Selenium; F = Florine; Hg = Mercury;  
Pb = Lead; U = Uranium; Zn = Zinc

	<u>Radium-226</u>	<u>Thorium-230</u>
Analysis of Samples Not Segregated By Particle Size	0.001229	0.002009

Values are expressed as micro curies per gram.



catalyst material. Spent sulfuric acid catalyst material currently is stockpiled on the site north of the old mill.

From 1958 to 1968, the U.S. Atomic Energy Commission (AEC) was the regulatory agency responsible for oversight of the Cotter facility. On February 1, 1968, the Colorado Department of Health assumed regulatory authority through an agreement with the federal government. Cotter's Colorado Radioactive Materials License expired on August 17, 1984. A license renewal application was submitted on March 30, 1984. The previous license is currently in effect under a regulatory timely renewal extension.

The State of Colorado (State) and Cotter have developed the Remedial Action Plan contained in this document in order to assess and effectively mitigate any impacts attributable to the mill facility to health, welfare and the environment.

## 2 REGIONAL SETTING AND SITE FEATURES

### 2.1 Demographics

The land use from Canon City south to the Cotter site changes from single and multi-family residential development to rural single family residences. This southern area typically consists of small grazing parcels for livestock. Canon City, located approximately 3.5 miles north of the Cotter mill site, has a population of 13,037 (1980 Census Data, Colorado Dept. of Commerce). Lincoln Park, a semi-rural area located between the mill site and the Arkansas River, is an unincorporated community with a population of 3,426 (1980 Census Data, Colorado Dept. of Commerce). Small-scale agricultural activities in the Lincoln Park area include growing fruits and vegetables. Livestock in the area include horses, beef and dairy cattle, sheep, and chickens.

The Canon City water district serves the Cotter mill and the Lincoln Park area. The majority of residences in Lincoln Park currently use the Canon City water supply for drinking water purposes through a direct connection; however, a number of residences use water from wells on their property either in addition to their Canon City water tap or as their sole supply. Some residences still use well water for stock watering and/or irrigation. The Lincoln Park water use survey (see Section 13) will be conducted to further determine the extent of ground water use by Lincoln Park residents.

## 2.2 Land Use

The Cotter site is near the center of a "bowl-like" geomorphic feature known as the Wolf Park Basin and is drained by Sand Creek, an intermittent, northward flowing stream that rises in the Wet Mountains and empties into the Arkansas River on the northeastern side of Lincoln Park. Canon City lies adjacent to the northern bank of the Arkansas River. The river begins its transition from the Rocky Mountains to the Great Plains physiographic provinces in the Canon City area. One of Colorado's major drainages, the Arkansas River from Leadville to Pueblo lies in a high-altitude, intermountain basin that consists of several structurally formed, alluvium-filled sub-basins joined by the Arkansas River and its tributaries. The Cotter mill site is located within one of these intermediate sub-basins.

A majority of the area surrounding the mill site and the site itself are above the 100 year flood plain of the Arkansas River (1982 Canon City Fringe Area Land Use Plan). Soil characteristics are generally favorable for development; however, geologic hazards such as slope failure, rock falls, swelling soils, and debris fans discourage further development in some areas south of the present Lincoln Park area.

The zoning for Lincoln Park is predominantly agricultural with single-family residences and some small rural businesses. Land use patterns described in the 1982

Canon City Fringe Area Land Use Plan include residential development for an area approximately 2.5 miles northwest of the Cotter site, and commercial and industrial development west and northwest of the Cotter site. The land immediately north, east and south of the mill site will be open range used for pasture and grazing.

### 2.3 Geology

The site is located on the axis of the Chandler syncline, a doubly-plunging, asymmetric fold with a steeply dipping northeastern flank. Dips on the west and south range from vertical to about 45 degrees northwest, while bedrock on the northeastern side dips southwest at 5 to 12 degrees. Bedrock units of importance at the site include the Poison Canyon Formation, Raton Formation, and the Vermejo Formation. An outcrop of resistant sandstones of the Raton Formation defines the syncline in the site area and forms an acute hogback ridge. This hogback ridge encloses Wolf Park, a topographic and structural basin.

Alluvium and terrace deposits of varying thicknesses overlie bedrock at the site. Beneath the alluvium and outcropping in and around the site is the Poison Canyon Formation. Consisting of interbedded and interfingered layers of shale, siltstone, sandstone, and conglomerate, this is the uppermost bedrock unit at the site. Fractures in the upper part of the Poison Canyon Formation are one of the major

pathways of ground water flow in the vicinity of the mill. Beneath the Poison Canyon Formation lies the Raton Formation.

Underlying the Raton Formation are the coal-bearing silty sandstones and shales of the Vermejo Formation. The Vermejo Formation is exposed at the land surface or underlies alluvial and terrace deposits in the area from the ridge adjacent to the SCS Dam northward to within a mile of the Arkansas River. The Vermejo Formation contains the seven coal seams that were mined. Approximately 60 percent of Section 16, including the area on which the mill is located, is underlain by the abandoned Wolf Park coal mine.

The Wolf Park Mine, in operation for over 25 years, was notable for a shaft sunk to a depth of approximately 1,084 feet. Mill derived constituents have been measured in water in the mine shaft.

Beneath the Vermejo Formation lies the Trinidad Sandstone. In the Lincoln Park area, the Trinidad Sandstone is typically overlain by alluvium. Available information indicates that ground water does not occur in significant quantities in this formation in the site area. Continuing toward the Arkansas River, the low-permeability Pierre Shale becomes the surface bedrock. The Pierre is the bottom of the shallow ground water system in the Lincoln Park area. Underlying formations are not considered to have significant effects on the ground water system near the site.

#### 2.4 Soils

Generally, the terrace deposits overlying the Poison Canyon Formation consist of sand, gravel, cobbles and boulders. These deposits range from 0 to 60 feet in thickness southwest of the SCS Dam. Northeast of the SCS Dam, alluvial deposits of the Arkansas River (approximately 80 feet thick) intrude and abut against a 120-foot thick gravel terrace. These terrace and alluvial deposits provide the majority of well water in Lincoln Park.

Natural undisturbed soils on the site are located near the site boundaries. Undisturbed soils lie principally along the southern and eastern boundaries of Section 16 and the eastern, western, and northern boundaries in Section 9, Township 19 South, Range 70 West. The undisturbed soils are described as the Pojoque Variant-Sedillo Complex, the Louviers-Travesilla Complex and the Travesilla-Rock Outcrop Complex. Smaller areas of Kim Loam and Fort Collins Loam also exist on the periphery of the disturbed area.

Most of the site soils are described as disturbed or reclaimed borrow areas. Stockpiles of graded earth and borrow materials, estimated at 2.8 million cubic yards by Cotter, are maintained on the site for future use and final reclamation.

## 2.5 Climatology

The climatology of the site is influenced by the immediate surrounding terrain. The summers are hot with an average daily maximum of 89.5 degrees Fahrenheit (°F) in July and a record maximum temperature of 101°F. The winters are relatively mild with an average daily minimum of 22.5°F in January and a record minimum temperature of -24°F. The mean annual precipitation for Canon City is 12.34 inches; most of the rain occurs from April through August (Colorado Climate Center, C.S.U.). Most of the summer precipitation is associated with local convective storms, and, accordingly, the precipitation during this portion of the year is quite variable.

The predominant wind directions are from the west-northwest and west with a secondary peak out of the east-southeast. The wind distribution is bimodal, being either westerly or east-southeast in direction. The southerly winds would be expected to be diminished due to the orographic features on and near the Cotter site, especially the high ridge just south of the facility. Existing data show a dominance of west-northwest winds at the facility.

## 2.6 Ground Water

Ground water impacted by the mill site has been detected in Lincoln Park. One principal ground water flow path has been demonstrated to exist from the mill site to

Lincoln Park ("shallow path"). Water in this shallow path travels through near-surface soils and bedrock. A significant data base exists identifying the shallow pathway from the mill along the Sand Creek drainage.

The geologic units underlying the mill site and environs include (beginning with the uppermost unit) the Poison Canyon Formation, on the mill site; the Raton Formation, at the SCS Dam; and the Vermejo and Trinidad Sandstones, and the Pierre Shale in Lincoln Park. In addition, alluvial sands and gravels may overlies all of these units at different areas. On the mill site, fracture flow is the significant ground water pathway. In Lincoln Park, flow through the alluvium is more significant than flow through the sandstones or the shale. The hydraulic head relationships indicate that ground water flows from the mill site to springs in Lincoln Park which flow to the Arkansas River.

The shallow ground water flow is down Sand Creek through the gap in the Raton Formation ridge, where the SCS Dam is located on the north side of the site. Alluvial materials in the Sand Creek drainage are more permeable than nearby sandstones and shales. The State suspects that additional pathways to the northeast and northwest of the shallow pathway described above may exist. Construction of various ground water remediation facilities at and near the mill site, and implementation of monitoring programs to



control and further define shallow ground water pathways are included in the RAP.

The State also suspects that a deep pathway for ground water flow from the mill site may exist. Ground water may flow down the abandoned Wolf Park mine shaft. A series of water samples collected from the old Wolf Park mine shaft contained mill derived constituents. Access to that sampling site ended when the mine shaft was plugged with bentonite clay and then backfilled in 1978. Monitoring activities will be conducted to determine the effectiveness of this clay plug and remediation steps will be taken, if necessary (See Section 11).

#### 2.7 Surface Water

The Arkansas River, one of the few perennial surface water bodies in the site area, begins near the Continental Divide and flows approximately 120 miles before reaching Canon City. Downstream of Canon City, water from the the Arkansas River is diverted into the Minnequa Reservoirs and the river flows through the Pueblo Reservoir. Stream flow typically remains relatively stable at about 200 to 400 cubic feet per second (cfs) during the fall and winter months, begins to increase in March, peaks in June, and then rapidly declines during the summer. Average annual streamflow is approximately 715 cfs. Streamflow is affected by transmountain diversions, storage reservoirs, municipal and

agricultural diversions, and their associated return flows. Six intermittent streams lie within two miles of the Cotter mill and are tributary to the Arkansas River. The mill site lies within the Sand Creek drainage. Sand Creek is the major drainage of the mill site and flows into the Arkansas River. Other drainages in the area which are tributary to the Arkansas River include: Wolf Park Creek, Forked Gulch, Willow Creek, Fawn Hollow, and Chandler Creek.

The site facilities and tailing ponds are along, and in part occupy, the course of Sand Creek. Sand Creek's estimated total drainage basin is 5.63 square miles (3,600 acres). The Sand Creek drainage area consists of three topographic regimes:

(1) Headwaters - characterized by steeply sloping mountainous terrain, sharply defined stream channels, and small amounts of ground water recharge. The headwaters extend from the upper reaches of the watershed to the hogback ridge upstream of the site;

(2) Wolf Park Basin - which has flatter terrain and broader stream channels, is primarily considered to be a ground water recharge area although some ground water flow from springs in the vicinity of the SCS Dam occurs. The Wolf Park Basin includes the area from the hogback ridge located upstream of the site north to the SCS Dam; and

(3) Arkansas River Alluvial Plain - which has gently sloping terrain, may discharge or recharge ground water depending upon the relative water table elevation, and includes the area from the SCS Dam to the confluence of Sand Creek and the Arkansas River.

Drainage patterns of the mill site area were modified when the SCS Dam was built in 1971-1972 to control flooding on the lower reaches of Sand Creek. The dam is located 4000 feet north of the main and secondary impoundments. Since the construction of the SCS Dam in 1971, surface runoff from the site has been isolated from Lincoln Park and impounded in the pool behind the SCS Dam. The lower outlet works from the dam were closed in 1978. Presently there is no overflow from the dam, and, since 1979, Cotter has been withdrawing the impounded water and pumping it into the main impoundment on the site.

Remediation activities include actions to manage surface runoff, and to monitor air quality and surface runoff. (See Sections 15, 18 and 23.)

2.8 Terrestrial Ecosystem

2.8.1. Vegetation

Most of the land surrounding the mill supports native vegetation and is used primarily for livestock and wildlife grazing. This vegetation consists of two basic types: pinyon-juniper woodland and plains grassland.

The pinyon-juniper woodland is dominated by small pinyon pine and single-seed juniper trees. Other shrub species complete the plant canopy. The understory is sparse and consists mostly of grass species such as blue grama and buffalo grass.

The plains grassland is dominated by wheat grasses, blue grama, red three-awn, and other short and mid-grasses. Forb and shrub species include scarlet globemallow, slimflower scurfpea, rabbitbrush, and yucca.

Agricultural land in the area consists of small orchards, gardens, and pastures in Lincoln Park and Canon City with some larger farms to the northeast along the Arkansas River. The larger farms produce alfalfa, barley, hay, oats, wheat, corn and apples. Pastures support stands of native grasses and alfalfa which are fed to beef and dairy cattle.

Urban vegetation in Lincoln Park and Canon City consists of lawns (both residential and at the golf course) and ornamental trees, shrubs, and forbs. Vacant lots, roadsides, and other disturbed areas support weedy plant species that are also found in disturbed areas of native vegetation.

An investigation into the possibility for adverse human health effects, including those from consumption of fruits, vegetables, and livestock, will be conducted (see Section 32).

### 2.8.2 Fauna

Birds comprise the most diverse group of vertebrates found in the area of the site and Lincoln Park. Of the 430 species of birds recorded in Colorado, 104 species are likely to use the area around the mill site while 295 species might use the areas around Lincoln Park and along the Arkansas River. Duck, pheasant, and quail are all hunted in the area. Utilization of the area by birds is primarily a function of habitat availability, the season of the year, food supply, and disturbance levels.

Approximately 36 species of mammals are likely to be found around the Cotter mill site with 46 species occurring in and around Lincoln Park. Mule and white-tailed deer, as well as several species of rabbit, are hunted in the area. Habitat diversity in the Lincoln Park area probably allows for greater species diversity for both mammals and birds as compared to the mill site.

Four species of amphibians may occur in the vicinity of the mill site, while five may occur around Lincoln Park. Seventeen reptile species are thought to live near the mill site, and sixteen may be found in the Lincoln Park area.

A wide variety of invertebrate species inhabit the Lincoln Park and site areas. This group includes insects, spiders, earthworms, nematodes (parasitic worms), and others.

These species provide an important food source for many species of birds, mammals, reptiles, and amphibians.

Five species which are listed as threatened or endangered by the U.S. Fish and Wildlife Service or by the Colorado Department of Natural Resources may occur in Fremont County, Colorado. Peregrine Falcon and Bald Eagle are of particular significance because both may use land adjacent to the Arkansas River as habitat.

## 2.9 Aquatic Ecosystem

The biotic portion of the aquatic ecosystem consists of three major groups of organisms. The groups are: (1) macroorganisms, including algae and bacteria, (2) macroinvertebrates, and (3) fish. An inspection of the seasonal dynamics of the algae community indicates that Chrysophytes are the dominant species except in late summer when water temperatures exceed 20°C and Cyanophytes dominate. During late summer, a transition between the two groups result in a peak abundance of Chlorophytes.

A total of 27 species of aquatic macroinvertebrates have been identified above Canon City in the Arkansas River. Simuliidae (blackflies) and Chironomidae (midges) comprise the majority of the organisms with Ephemeroptera (mayflies) the third most common group.

No quantitative fishery data are available on the Arkansas River in the vicinity of the Cotter site. A

comparison of upstream and downstream data indicates that the river reach near Canon City represents a transition between a cold-water trout fishery and a warm-water fishery located primarily at Pueblo Reservoir. It is probable that representatives of both fisheries would be present near Canon City.

The Minnequa Reservoirs are a series of off-line reservoirs created by diversion of Arkansas River water at the Minnequa Dam into the Minnequa Canal. The water is used primarily for water supply for CF&I Steel Co. in Pueblo, Colorado.

### 3 SCOPE OF REMEDIAL ACTION PLAN

The scope of this Remedial Action Plan (RAP) is to describe the purposes, standards and requirements of the remedial activities. The remediation program addresses ground water, surface media, and public health. Within each Section, the specific activity descriptions include:

1. A brief description of the mill operations and relevant environmental conditions.
2. A description of the remedial activity tasks and purposes.
3. A description of the assessments and engineering activities Cotter is required to perform and a listing of requisite submittals to the State.
4. A schedule for implementation of the Remedial Action Plan, submittals by Cotter to the State, and responses to Cotter by the State.

The RAP as presented herein includes a description of engineering and construction activities, requisite studies and assessments, and procedures to be implemented by Cotter to lead to the ultimate cleanup and remediation of the Cotter site and other affected areas adjacent to and near the site.

Items that are not specifically addressed herein include but are not limited to the following:

1. Mill operations and waste disposal;
2. Occupational exposure;



3. Mill decommissioning;
4. Site Reclamation;
5. Long-term monitoring, except as otherwise stated, and maintenance;
6. Aspects of site water management plan.

These items are to be addressed pursuant to all applicable and relevant and appropriate law.

3.1 General RAP Provisions

3.1.1 RAP Annual Report

Except as otherwise provided herein, for the purpose of this RAP, one annual report shall be required. The RAP Annual Report shall be comprised of sections addressing each of the remedial activities as specified in this RAP, and shall be submitted by Cotter to the State by June 30 of each year after the entry of the Consent Decree by the Court. As specified in this RAP, the Annual Report shall include information pertaining to RAP activities undertaken during the preceding calendar year.

3.1.2 RAP Liquid Disposal Capacity

Cotter shall not be excused from the performance of the requirements of this RAP on the basis that it lacks sufficient capacity on its site for the storage, treatment, disposal or management of liquid generated as a result of the implementation of this RAP.

### 3.1.3 Surface Water Releases

Water produced by remedial activities shall not be released to the surface unless approved by the State. The basis for State approval shall be a demonstration that such release shall meet the provisions of the Colorado Water Quality Control Act and all regulations promulgated thereunder; shall be compatible with Sections 24, 26, 27, and 29 of the RAP, and compatible with Section 30 of the RAP during the term of the preliminary study described in Paragraph 1 of Section 30.2; and shall not prevent the achievement of the ground water quality objectives stated in Section 14.1.3 of the RAP.

### 3.2 Definitions

#### 3.2.1 Well Design

New monitoring wells shall be designed as described below:

##### 3.2.1.1 Class A Wells

Class A wells shall be constructed in accordance with Figure 3-1 and shall include:

1. A casing which is fully sealed from the ground surface to the top of the monitored interval;
2. Inert casing material, such as epoxy resin bonded fiberglass, which is neutral with respect to the chemistry of the ground water;

3. Permanently installed, EPA approved, bladder pump water sampling system;

4. A secure, locked wellhead.

3.2.1.2 Class B Wells

Class B wells shall be cased with four (4) inch internal diameter (ID) PVC pipe, or equivalent pipe approved by the State, which is slotted in the monitoring zone, gravel packed, and the remainder of the borehole sealed with a cement or bentonite grout. Class B wells shall be fitted with a secure, locked wellhead.

3.2.1.3 Piezometers

Piezometers shall be cased with no smaller than 2-inch ID PVC pipe, or equivalent pipe approved by the State, with an appropriate screened interval. The length of the screened interval shall be recorded and reported to the State. A sand or gravel pack shall be installed opposite the screen, and the remainder of the borehole sealed with a cement or bentonite grout. Piezometers shall be fitted with a secure locked wellhead.

3.2.1.4 Well and Piezometer Surveying

Elevations of well or piezometer measuring points shall be determined to the nearest 0.1 foot, except that where hydraulic heads in piezometers are compared against each other as a performance criterion, measuring point elevations shall be determined to the nearest 0.01 foot. Surveying shall be

conducted by a qualified surveyor within the first year of installation, and, with respect to piezometers compared against each other as a performance criterion, measuring point elevations shall be recertified by a qualified surveyor at least every two years. Water level measurements shall be made with either a chalked steel tape or with an electric probe. If an electric probe is used, its length shall be calibrated under hanging conditions at least annually and whenever any maintenance or repair is performed which may affect the depth measurement. Depth to water will be measured and recorded to the nearest 0.01 foot.

3.2.2 Quality Assurance/Quality Control

Quality Assurance/Quality Control (QA/QC) plans describe procedures to be used and standards to be met in the execution of the remedial activities in this document. Cotter shall submit a QA/QC Plan, as required by the Requisite Assessments and Engineering Activities and Schedule for each remedial activity. The State shall review and act upon each remedial activity QA/QC Plan in accordance with the schedule for that particular remedial activity. If Cotter proposes a modification to any QA/QC Plan, the State shall have ninety (90) days following written notice of the proposed modification to approve or disapprove such change.

The State shall have the right to the results of any analysis conducted for the purposes of RAP implementation.

and the right of access to any retained sample material collected in conjunction with RAP implementation so long as the use of this sample material by the State does not deprive Cotter of the material needed to comply with this RAP.

Each remedial activity QA/QC plan shall include, specifically or by reference, as appropriate:

1. Description of, and rationale, as appropriate for:

- a. construction specifications;
- b. material specifications;
- c. sample procurement;
- d. sample handling;
- e. sample preparation;
- f. data handling and reporting;
- g. statistical treatments of analytical results;
- h. laboratory analysis;
- i. limits of detection;
- j. documentation of chain of custody of samples;
- k. blind, spiked, and duplicate samples, including the total number and frequency of each;
- l. confidence levels for sources of error;
- m. calibration and operation of equipment;

- n. computer program documentation, if applicable;
- o. procedures for follow-up of anomalous data.

2. Documentation of consideration and incorporation of applicable guidelines and requirements for sampling and analysis established by the U.S. Environmental Protection Agency, the U.S. Nuclear Regulatory Commission, and the Colorado Department of Health;

3. Proposed laboratory facility or facilities to be used in analyzing samples, if applicable.

3.2.3 Soils and Sediment Analysis

Except for samples collected in accordance with Sections 21 (On-site Soils) and 24 (Site Site Adjacent Soils), all soil and sediment samples shall be sieved with stainless steel mesh. The less than 100 mesh fraction shall be analyzed after preparation with a nitric acid/perchloric acid ( $\text{HNO}_3/\text{HClO}_4$ ) digestion. The data shall be analyzed and reported on an air dry weight basis.

3.2.4 Background Data Set for Soils and Sediments

Unless specifically stated otherwise, the background data set for soils and sediments, which shall be used in calculating background mean and background range, as further defined below, shall be collected according to the schedule in Paragraph 6 of this Section 3.2.4 and the following criteria and requisite assessments. The "target

elements" are uranium, molybdenum, radium-226, and, as specified in Section 29, thorium-230. These target elements can be used to evaluate the remediation of soils and sediments. If the concentrations of these elements have been reduced to standards specified in this RAP, then the concentrations of other constituents originating at the site also should have been reduced to acceptable levels. Furthermore, with respect to Section 29, if a correlation can be demonstrated to the State's satisfaction that clean-up of radium-226 and molybdenum to the required levels also reduces thorium-230 to levels acceptable to the State, then Cotter need only analyze for molybdenum and radium-226. However, with respect to Section 29, if a correlation acceptable to the State is not demonstrated, then thorium-230 must be analyzed in conjunction with radium-226 and molybdenum.

1. Representatives of Cotter and the State shall jointly locate five (5) reference sub-basins by field investigation. The five (5) sub-basins shall include:
  - a. approximately one hundred and fifty (150) acres each;
  - b. geology, soils, vegetation (pinyon and juniper), and geomorphology similar to the geology, soils, vegetation, and geomorphology present on and adjacent to the mill site.

2. Cotter shall prepare and submit to the State a plan for the reference sub-basin sampling program, which shall include:

a. Collection of samples in the top fifteen (15) centimeter layer of surface soil according to the following:

- i. samples shall be collected from four (4) sites selected jointly and randomly by Cotter and the State within each reference sub-basin;
- ii. each sample shall be a composite from five (5) randomly selected locations within a 900 square meter area (thirty (30) meters on a side) centered on the selected sampling site;
- iii. where target element concentrations in soil samples are below the analytical detection limit, a value equal to the detection limit shall be used for calculation purposes.

b. Collection of samples in the top fifteen (15) centimeter layer of dry sediments according to the following:



- i. samples shall be collected from four (4) sites selected jointly and randomly by Cotter and the State within each reference sub-basin. Each sample site shall be located at the lowest point of the sub-basin channel;
  - ii. each sample shall be a composite from five (5) randomly selected locations along a thirty (30) meter channel segment;
  - iii. where target element concentrations in dry sediment samples are below the analytical detection limit, a value equal to the detection limit shall be used for calculation purposes.
- c. Collection of wet sediment samples, where available, according to the following:
- i. samples shall be collected from four (4) sites selected jointly by Cotter and the State within each reference sub-basin. Each sample site shall be located at the

lowest point of the sub-basin channel.

- ii. each sample shall be a composite from five (5) randomly selected locations along a thirty (30) meter channel segment.
  - iii. wet sediment samples shall include the top fifteen (15) centimeter layer where possible;
  - iv. where target element concentrations in wet sediment samples are below the analytical detection limit, a value equal to the detection limit shall be used for calculation purposes;
- d. An alternate method for establishing a background data set for wet sediments, if wet sediments are unavailable within the reference sub-basins;
- e. Gamma scintillometer surveys according to the following:
- i. a reference grid of nine hundred (900) square meters (thirty (30) meters on a side), with scintillometer readings at ten

(10) meter intervals, shall be surveyed at each surface soil sampling site. An equivalent channel sampling segment area at each dry sediment sampling site with three (3) scintillometer readings (center of channel and at each side) at ten (10) meter intervals;

ii. scintillometer readings from the corners of each one hundred (100) square meter grid shall be averaged to produce a data point for each reference grid (a total of one hundred and eighty (180) data points for soils and one hundred and eighty (180) data points for dry sediments);

f. Proposed analysis methods;

g. QA/QC Plan.

3. All background samples shall be analyzed for uranium, molybdenum, radium-226 and thorium-230.

4. Means and standard deviations of the background data set shall be calculated.

5. Cotter shall submit a written final implementation report on the reference sub-basin sampling program, which shall include:

- a. Summary of methods and procedures;
- b. Location of all sampling sites;
- c. Data collected;
- d. Explanation of and response to unexpected conditions;
- e. Quality assurance and quality control evaluation.

6. The activities for establishing the background data set shall be performed according to the following schedule:

- a. Within thirty (30) days of the entry of a Consent Decree by the Court, Cotter and the State shall locate five (5) reference sub-basins.
- b. Cotter shall propose a plan and schedule for the reference sub-basin sampling program within ninety (90) days of the selection of the reference sub-basins.
- c. The State shall act upon the plan and schedule within ninety (90) days.
- d. Cotter shall initiate the reference sub-basin sampling program in accordance with the approved schedule.

- e. Unless an alternative method is necessary to conduct the wet sediment sample collection, Cotter shall complete the reference sub-basin sampling program within two (2) years after implementation of the plan.
- f. Cotter shall submit the final report on the reference sub-basin sampling in conjunction with the schedule set forth in Paragraph 4 of Section 29.4 regarding the sub-basin release soil studies and/or installation of silt fences.
- g. The State shall act upon the report within sixty (60) days after its receipt.

3.2.5 Background Mean for Soils and Sediments

Unless specifically stated otherwise, the background mean concentrations of radium-226, uranium, molybdenum and thorium-230, (i.e., the target elements), shall be established from background data sets collected in accordance with Section 3.2.4.

3.2.6 Background Range for Soils and Sediments

The background range for a given target element in any data set shall be the concentration range within two standard deviations of the mean of the background data set.

If the mean of a given monitoring data set is not greater than the background range, then the monitoring data set is considered to be within the background range. If the mean of a given monitoring data set is greater than the background range, then the monitoring data set is not considered to be within the background range.

### 3.2.7 Steady State

Analysis of a monitoring data set to determine whether the concentration of a target element (i.e., uranium, molybdenum, radium-226, and, if appropriate pursuant to Section 29, thorium-230), is at steady state shall be conducted using a linear regression performed on a plot of the concentration of a target element over time. The slope of the least-square linear regression line shall be tested to determine if the slope is significantly different from zero using a one-tailed t-test as described in Chapter One of Applied Regression Analysis, second edition, by Norman Draper and Harry Smith (Wiley, New York, 1981). The independent variable shall be time, and the dependent variable shall be the concentration of the particular target element. If the one-tailed t-test determines that the slope is significantly different from zero at the ninety-five (95) percent confidence level, a significant trend is occurring. If no significant trend is occurring, a steady state condition exists or has been achieved for that particular target element at the

sampling location. If the data suggest clear seasonal trends, these trends shall be considered in the data analysis.

Where there is more than one data point available in any month, the arithmetic average of those values will be used for that month.

## 4 MAIN AND SECONDARY IMPOUNDMENTS

### 4.1 Description of Operations and Relevant Environmental Conditions

From 1958 to 1979, mill tailings were disposed in a series of unlined and lined ponds. In 1978 construction of a double-lined, double cell impoundment began. This new impoundment includes an 18-inch thick layer of compacted clay which serves as a liner and an overlying layer of a synthetic membrane liner (Hypalon). The Hypalon was covered with a random fill material. Construction of the new impoundment, which was segregated into a 91-acre main impoundment and a 44-acre secondary impoundment, was completed in 1979. The main impoundment has been used since September of 1979 for the disposal of tailings from ongoing mill operations and water collected from current ground water interception facilities. From April 1981 to August 1983, the tailings from the Old Tailings Ponds Area was moved to the secondary impoundment using conventional earthmoving equipment.

The State suspects that the new impoundment may be leaking, and, if so, is a continuing source of ground water impact.

### 4.2 Remedial Activities

The purpose of these remedial activities is to collect leakage, if any, from the main and secondary impoundments, to intercept, to the maximum extent reasonably achievable, ground water flow moving from the Old Tailings



Pond Area to the area beneath the new impoundments, and in conjunction with the other ground water remedial activities to achieve the ground water quality objectives stated in Section 14.

Cotter shall perform the following remedial activities:

1. Cotter shall design, construct and operate a withdrawal well system along the toe of the outer embankments of the new impoundments. The line of withdrawal wells shall extend to the east and southwest of the new impoundments to points where the concentration of molybdenum in the withdrawal wells drops below 1.0 mg/l. The screened interval of the withdrawal wells shall be in the Poison Canyon Formation.

2. As an element of the withdrawal well system design plan, Cotter shall propose a piezometer configuration, data to be collected, and a protocol for interpreting the data to determine whether a ground water gradient towards the withdrawal well system is being maintained in the Poison Canyon Formation. The piezometers shall be placed at 200 foot intervals unless a different interval is approved by the State. The piezometer design and well operation shall be sufficient to demonstrate that, to the maximum extent reasonably achievable, a gradient exists to the withdrawal wells at all locations between each pair of withdrawal wells. An example of the type of conceptual design which would be

acceptable to the State would include: the first line of piezometers (Line A) would be placed midway between adjacent withdrawal wells. A second line of piezometers (Line B) would be constructed west or north of the first line, so that a line drawn between two adjacent piezometers, one for each line, is perpendicular to the first line (see Figure 4-1).

As an element of the construction report filed after installation of the withdrawal well system, Cotter shall review the protocol for interpreting the data proposed in the design plan. Cotter shall incorporate any modifications necessary in response to information obtained in the construction of the withdrawal wells, and shall propose a final protocol for determining whether ground water gradient towards the withdrawal wells is being maintained in the Poison Canyon Formation.

3. In the event that the monitoring data, as interpreted by the protocol, indicate that the ground water gradient towards the withdrawal wells is not being maintained, Cotter shall notify the State, and then conduct an analysis to determine whether a transient condition caused by, among other things, unusual precipitation, infiltration, etc., has changed gradient conditions. If it is determined that a transient condition does not exist, Cotter shall modify the withdrawal well system pursuant to the schedule set forth in the transient condition report. Cotter shall prepare and submit

to the State a report describing the modification of the withdrawal well system.

4. The withdrawal wells and piezometers located adjacent to the main impoundment shall be operated and maintained continuously until flushing of the Old Tailings Pond Area is completed, the free-standing liquid has been removed from the main impoundment, and the main impoundment has been capped with clay. The withdrawal wells and piezometers located adjacent to the secondary impoundment shall be operated and maintained continuously until flushing of the Old Tailings Pond Area is completed, and phased closure of the secondary impoundment is underway. Cotter may apply for an earlier termination of a particular withdrawal well. The basis for this application shall be a demonstration that the well has been operationally dry for a period of five (5) consecutive calendar quarters. The State shall review and act upon any such application within ninety (90) days of its receipt.

5. The water pumped from the withdrawal wells shall not be, unless approved by the State, (1) reinjected into the ground water downgradient of the SCS hydrologic barrier, or (2) released to the surface. The basis for State approval of such use shall be a demonstration that such use or release shall meet the requirements set forth in Section 3.1.3. Pursuant to appropriate restrictions, the water may be.

used in the mill circuit, discharged to the main or secondary impoundment, used in the flushing of the Old Tailings Ponds Area, or in the Section 9/16 hydraulic barrier, provided that such use of the water shall not adversely impact the ability to achieve ground water quality objectives stated in Section 14.

4.3 Requisite Assessments and Engineering Activities

Cotter shall prepare and submit to the State for review and approval the following:

1. A plan for the design, construction and operation of the line of withdrawal wells, which shall include:
  - a. Design drawings, including the protocol designed for verifying that the ground water gradient is toward the withdrawal wells;
  - b. Construction specifications;
  - c. Quality Assurance/Quality Control (QA/QC) plan;
  - d. Construction schedule;
  - e. Operations and maintenance plan;
  - f. Proposed withdrawal rates;
  - g. Permeability data and calculations to justify well depth, well spacing and pumping rates;

h. Disposal of withdrawn water;

2. A Final Construction Report, which shall include:

- a. As-built drawings;
- b. Explanation of and response to unexpected conditions and problems;
- c. Quality assurance evaluations;
- d. Proposed modifications to operation and maintenance plans, or protocol for verifying that the gradient in the Poison Canyon Formation is toward the withdrawal wells.

3. An annual summary on the operation and maintenance of the line of withdrawal wells, which shall include:

- a. Description of operations, including rates of withdrawal;
- b. Explanation of and response to unexpected conditions and problems;
- c. Monthly water level measurements;
- d. Analysis to demonstrate that the line of withdrawal wells is accomplishing the purposes set forth in Section 4.2.

4. The transient condition analysis report, if required, shall include:

- a. A proposed modification of the withdrawal well system which will result in the reestablishment of the gradient towards the withdrawal wells. The modification may be either a modification in the operation of the system or the construction of additional facilities;
- b. Analysis which indicates that the design modification will achieve the reestablishment of the gradient towards the withdrawal wells;
- c. Construction specifications (if required);
- d. Quality Assurance/Quality Control Plan;
- e. Construction or Implementation Schedule;
- f. Operations and Maintenance Plan;
- g. Proposed withdrawal rates.

5. Cotter shall submit to the State a final construction report for any construction required under Paragraph 4 of this section. The report shall include:

- a. As-built drawings;
- b. Explanation of and response to any unexpected conditions and problems;
- c. Quality assurance evaluation;

- d. Proposed modifications of operations and maintenance plan.

4.4 Schedule

Cotter shall conduct these remedial activities according to the following schedule:

1. Within ninety (90) days after the entry of a Consent Decree by the Court, Cotter shall submit to the State a plan for the design, construction and operation of the withdrawal well system, which includes the piezometer monitoring program.

2. The State shall act upon the plan for the design, construction and operation of the withdrawal well system within ninety (90) days of its receipt.

3. Cotter shall complete the construction and start the operation of the withdrawal well system pursuant to the approved schedule required by Paragraph 1 of Section 4.3, but in no event later than September 30, 1989.

4. Cotter shall submit a written final construction report to the State within one hundred twenty (120) days of the completion of the construction of the withdrawal well system.

5. The State shall act upon the final construction report within one hundred twenty (120) days of its receipt.

6. Cotter shall submit, as part of the RAP Annual Report specified in Section 3.1, a written annual summary on the operation and maintenance of the withdrawal well system described in Section 4.2.

7. The State shall act upon the Annual Report on the operation and maintenance of the withdrawal well system within one hundred twenty (120) days of its receipt.

8. Cotter shall submit written notification to the State pursuant to the requirements of Paragraph 3 of Section 4.2 within thirty (30) days of the collection of the water level data.

9. Cotter shall submit to the State the transient conditions report required under Paragraph 4 of Section 4.3 of the Plan within ninety (90) days of the collection of the water level data.

10. The State shall act upon the transient condition report within sixty (60) days of its receipt.

11. Cotter shall initiate any withdrawal well system modification required under Paragraph 4 of Section 4.3 in accordance with the approved schedule in the withdrawal well modification/transient condition report.

12. Cotter shall submit a final construction report for any construction required under Paragraph 5 of Section 4.3 within one hundred twenty (120) days of its completion.



13. The State shall act upon this report within one hundred twenty (120) days of its receipt.

## 5 SECONDARY IMPOUNDMENT

### 5.1 Description of Operations and Relevant Environmental Conditions

From 1981 through 1983, approximately 2.2 million cubic yards of tailings material was moved from the Old Tailings Ponds Area to the double-lined secondary impoundment using conventional earthmoving equipment.

In conjunction with the main impoundment and water distribution pond, the secondary impoundment will provide the capability to manage the accumulation of excess water, if any, which results from the implementation of this RAP.

After raising the elevation of the Hypalon liner, the secondary impoundment will receive liquid from the main impoundment, water distribution pond, withdrawal well water, pumpback water from the SCS hydrologic barrier and/or other waters from the site for evaporation.

The secondary impoundment currently is a potential source of wind dispersed particulates. Controlling exposure of tailings in the secondary impoundment is addressed in this Section.

### 5.2 Remedial Activities

The purpose of this remedial activity is to provide a means to manage the accumulation of liquid on the mill site, to reduce, to the extent feasible, the hydraulic head in the main impoundment and, in conjunction with the

other ground water remedial activities, to achieve the ground water quality objectives stated in Section 14.

The purpose of these remedial activities also is to effectively minimize and mitigate the secondary impoundment as a potential source of wind dispersed particulates.

Cotter shall perform the following remedial activities:

1. In conjunction with the SCS barrier construction, Cotter shall construct an evaporation pond in the secondary impoundment. An additional liner shall not be required. The secondary impoundment shall be for evaporation of liquids from the milling operation or from remediation activities.

2. Prior to construction of an evaporation pond in the secondary impoundment, dust control shall be accomplished by furrowing the surface of the secondary impoundment.

3. Following construction of an evaporation pond in the secondary impoundment, Cotter shall manage the secondary impoundment to:

- a. Maintain a nominal liquid depth of at least one (1) foot over the entire surface area of the secondary impoundment, with the exception of the solid waste disposal area, which shall

not be used for the disposal of free-standing liquid. This condition acknowledges that liquids may be present in the solid waste disposal area as a result of precipitation and infiltration from the evaporation pond. The solid waste disposal area shall be dewatered, as necessary, to avoid significant liquid accumulation.

5.3 Requisite Assessments and Engineering Activities

Cotter shall prepare and submit to the State for review and approval the following:

1. An interim plan to control dust by furrowing the secondary impoundment.

2. A plan for an evaporation pond in the existing secondary impoundment, which shall include:

- a. Design drawings;
- b. Construction specifications;
- c. Soils data for soil borrow areas describing the molybdenum, uranium and radium-226 concentrations in those soils that will be used as the foundation for the increase in the Hypalon elevation;
- d. Operations and maintenance plan;
- e. Construction schedule.

3. A written final construction report, which shall include:

- a. As-built drawings;
- b. Explanation of and response to unexpected conditions and problems;
- c. Quality assurance evaluations.

4. A written annual summary on the implementation of this remedial activity to effectively minimize and mitigate the secondary impoundment as a potential source of wind dispersed particulates, which shall include as appropriate:

- a. Summary description of results of activities; and
- b. Explanation of unexpected conditions and responses to any problems which prevent effective minimization and mitigation of the secondary impoundment as a potential source of wind dispersed particulates.

5.4 Schedule

Cotter shall conduct these remedial activities according to the following schedule:

1. Cotter shall submit a plan for dust control by furrowing the secondary impoundment to the State within thirty (30) days after the entry of the Consent Decree by the Court.

2. The State shall act upon the plan within thirty (30) days of receipt.

3. Cotter shall implement the approved plan within thirty (30) days of receipt of State approval.

4. Within five (5) days after entry of a Consent Decree by the Court, Cotter shall submit a design plan and schedule for the construction of the secondary impoundment evaporation pond.

5. The State shall act upon this design plan and schedule within fifteen (15) days of its receipt.

6. Cotter shall construct the secondary impoundment evaporation pond in conjunction with the construction of the hydrologic barrier at the SCS Dam.

7. Cotter shall file a written final construction report with the State within one hundred twenty (120) days of the completion of the construction of the secondary impoundment evaporation pond.

8. The State shall act upon the final construction report within one hundred twenty (120) days of receipt.

9. Cotter shall submit, as part of the RAP Annual Report specified in Section 3.1, a written annual summary as described in Paragraph 4 of Section 5.3.

10. The State shall act upon the Annual Report within one hundred twenty (120) days of its receipt.

## 6 WATER DISTRIBUTION POND

### 6.1 Description of Operations and Relevant Environmental Conditions

A compacted clay and membrane-lined water distribution pond will be constructed in the area formerly occupied by Pond No. 7, which was a fire water pond. This pond will function as a surge pond to control the inflows and outflows of water from the SCS hydrologic barrier, withdrawal wells, flushing extraction wells, and/or site runoff.

### 6.2 Remedial Activities

The purpose of this remedial activity is to provide a means to manage the accumulation of liquid on the mill site, and in conjunction with the other ground water remedial activities, to achieve the ground water quality objectives stated in Section 14.

The water distribution pond will be built in conjunction with the secondary impoundment evaporation pond. This water distribution pond will provide surge capacity for pumpback water from the SCS hydrologic barrier, withdrawal wells and/or the flushing extraction wells prior to distribution to the mill process, main impoundment, secondary impoundment, or reuse in remedial activities on site pursuant to appropriate restrictions.

The water distribution pond design incorporates a double liner system consisting of twenty-four (24) inches of compacted clay overlain by a membrane liner. The water

distribution pond shall be constructed pursuant to the requirements of 40 C.F.R. 192.32(a)(1) incorporating 40 C.F.R. 264.221 (as codified on January 1, 1983). The liner system shall prevent any migration out of the pond into adjacent soils, ground water or surface water during the active life of the facility and, after pond closure, the liner system shall be removed. Post-closure soil clean-up shall be verified pursuant to Section 21.

6.3 Requisite Assessments and Engineering Activities

Cotter shall prepare and submit to the State for review and approval the following:

1. Cotter has submitted to the State the plan for the water distribution pond, which includes:

- a. Design drawings;
- b. Construction specifications.

2. A schedule for construction of the water distribution pond, which shall include:

- a. Soils data for the area underneath the pond and soil borrow areas describing the molybdenum, uranium and radium-226 concentration of these soils that will be used for the construction of the water distribution pond;
- b. Operations and maintenance plan;
- c. QA/QC Plan.



3. A written final construction report, which shall include:

- a. As-built drawings;
- b. Explanation of and response to unexpected conditions and problems;
- c. Quality assurance evaluations.

4. A written annual summary of activities undertaken pursuant to the operations and maintenance plan described in this section.

6.4 Schedule

Cotter shall conduct this remedial activity according to the following schedule:

1. Cotter has filed with the State a design plan for the construction of the water distribution pond.

2. Cotter shall submit a schedule for construction of the water distribution pond within ten (10) days after the entry of the Consent Decree by the Court.

3. The State shall act upon the schedule within fifteen (15) days after receipt of the schedule.

4. Cotter shall construct the water distribution pond in conjunction with the construction of the hydrologic barrier at the SCS Dam.

5. Cotter shall file a written final construction report with the State within one hundred twenty

(120) days of the completion of the construction of the water distribution pond.

6. The State shall act upon the final construction report within one hundred twenty (120) days of its receipt.

7. Cotter shall submit, as part of the RAP Annual Report specified in Section 3.1, an annual activities summary as required by Paragraph 4 of Section 6.3.

8. The State shall act upon the Annual Report within one hundred twenty (120) days of its receipt.

## 7 NEUTRALIZATION OF THE PRIMARY IMPOUNDMENT

### 7.1 Description of Operations and Relevant Environmental Conditions

The Cotter Radioactive Materials License for the mill requires that the pH of the liquids in the main impoundment be adjusted to approximately 4.2. This requirement is based upon the recommendation found in the Supplement to Design Report, Cotter - Uranium-Vanadium Tailings Impoundment, W.A. Wahler & Associates, January 1979. The pH of the main impoundment is approximately 2.3.

### 7.2 Remedial Activities

The purpose of these remedial activities is: 1) to evaluate impacts, if any, of the acid tailings upon the clay liner; 2) to evaluate the technical feasibility of neutralization of the main impoundment; 3) if necessary and feasible, to effectively minimize and mitigate significant degradation of the clay liner shown to be caused by the low pH tailings; and 4) in conjunction with the other ground water remedial activities to achieve the ground water quality objectives stated in Section 14.

1. Cotter shall design and implement a plan to evaluate impacts, if any, of the acid tailings on the clay liner, including an analysis of the ability of the liner to raise the pH of the liquids passing through it, the volume of the liquid which could exhaust this ability to raise the pH of

the liquids, and changes in clay liner permeability that reactions with the liquid might cause.

2. If necessary, on the basis of the report described in Paragraph 2 of Section 7.3, Cotter shall design and implement a plan to evaluate the technical feasibility of neutralization of the liquids in the main impoundment.

3. If necessary and feasible, Cotter shall design and implement a plan to effectively minimize and mitigate significant degradation of the clay liner shown to be caused by the low pH tailings.

7.3 Requisite Assessments and Engineering Activities

Cotter shall prepare and submit to the State for review and approval the following:

1. A plan to evaluate impacts, if any, of the acid tailings, which shall include:

- a. Description of proposed actions;
- b. Quality Assurance/Quality Control (QA/QC) Plan;
- c. Schedule;

2. A report of the findings and conclusions of the evaluation conducted pursuant to Paragraph 1 of Section 7.3.

3. If required by the State-approved findings of the impact evaluation program described in Paragraph 1 of Section 7.2, a plan to evaluate the technical feasibility of

main impoundment neutralization in order to prevent significant degradation of the clay liner.

4. A report of the findings and conclusions of the technical feasibility evaluation conducted pursuant to Paragraph 3 of Section 7.3.

5. If necessary and feasible, a plan to effectively minimize and mitigate significant degradation of the clay liner shown to be caused by the low pH tailings, which shall include:

- a. Description of proposed actions;
- b. Operations and maintenance plan;
- c. QA/QC Plan;
- d. Schedule;

6. If the plan described in Paragraph 5 of Section 7.3 is implemented, a report on its implementation, which shall include:

- a. A report of the results of the implementation of the plan;
- b. Explanation of and response to unexpected conditions and problems;
- c. Quality assurance evaluations.

7. As part of the RAP an Annual Report as specified in Section 3.1, an annual summary, which shall include:

- a. Status of actions taken;

- b. pH of the liquids in the impoundments, measured quarterly;
- c. Quality assurance evaluations;
- d. Explanation of and response to unexpected conditions and problems.

7.4 Schedule

Cotter shall conduct these remedial activities according to the following schedule:

1. Within sixty (60) days of the entry of a Consent Decree by the Court, Cotter shall submit a plan to evaluate impacts, if any, of the acid tailings.
2. The State shall act upon the proposed impact evaluation plan within thirty (30) days of its receipt.
3. Pursuant to the approved schedule set forth in the impact evaluation plan, Cotter shall complete the impact evaluation plan and submit its findings and conclusions as to whether neutralization is necessary to effectively minimize and mitigate significant degradation of the clay liner.
4. The State shall act upon the findings and conclusions of the impact evaluation plan within sixty (60) days of its receipt.
5. If required, based on the State-approved findings and conclusions of the impact evaluation report, Cotter shall submit a plan to evaluate the technical

feasibility of neutralization of the liquids in the main impoundment within sixty (60) days of the State's action pursuant to Paragraph 4 above.

6. The State shall act upon the proposed plan to evaluate the technical feasibility of main impoundment neutralization within sixty (60) days of its receipt.

7. Pursuant to the approved schedule in the technical feasibility evaluation plan, Cotter shall complete the technical feasibility evaluation plan and submit its findings and conclusions, and, if impoundment neutralization is necessary and feasible, submit a plan to effectively minimize and mitigate significant degradation of the clay liner shown to be caused by the low pH tailings.

8. The State shall act upon this plan within sixty (60) days of its receipt.

9. If a plan is submitted pursuant to Paragraph 7 of this Section 7.4, Cotter shall complete the implementation of the plan pursuant to the approved schedule set forth in the plan described in Paragraph 5 in Section 7.3.

10. If the plan described in Paragraph 5 of Section 7.3 is implemented, Cotter shall submit an implementation report pursuant to Paragraph 6 of Section 7.3 within sixty (60) days of its completion.

11. The State shall act upon the implementation report within sixty (60) days of its receipt.

12. Cotter shall submit as part of the RAP Annual Report specified in Section 3.1, the written annual summary specified in Paragraph 7 of Section 7.3.

13. The State shall act upon the Annual Report within one hundred twenty (120) days of its receipt.



## 8 OLD TAILINGS PONDS AREA

### 8.1 Description of Operations and Relevant Environmental Conditions

During the operation of the old alkaline leach mill (1958-1979) tailings were discharged into seven of ten ponds. Tailings from the catalyst plant were placed in a separate pond. Seven of the ten ponds were unlined. In 1978, during construction of the secondary impoundment, ponds 9 and 10 were removed, and this new impoundment was constructed over the location formerly occupied by those ponds. The tailings from the six remaining ponds were removed during 1981-1983, and were deposited in the secondary impoundment. One remaining pond is lined and is used for the storage of mill site runoff. Old pond 7 is unlined, is presently not in use, but was used to store water for fire control.

During the time the old ponds were used for tailings disposal, liquids from the tailings entered the underlying soil and ground water. This ground water flows from the Old Tailings Ponds Area to the SCS Dam and then continues into Lincoln Park.

### 8.2 Remedial Activities

The purpose of these remedial activities is to identify the area where flushing will be conducted, to conduct a ground water flushing and surface soil removal program to effectively minimize and mitigate the Old Tailings Ponds Area as a source of ground water impact, and in conjunction with

other ground water remedial activities to achieve the ground water quality objectives stated in Section 14.

Cotter shall perform the following remedial activities:

1. Cotter shall design and conduct an initial evaluation of the Old Tailings Ponds Area for the purpose of selecting and designing effective injection and extraction ground water flushing technologies to test on a pilot scale. The initial evaluation shall include the following:

- a. Appropriate core and water quality samples shall be collected from areas upgradient of the SCS Dam and, in conjunction with other data, used to determine the chemical characterization of uranium and molybdenum within the soils and ground water and in order to identify the zone in the Old Tailings Ponds Area to be flushed;
- b. Appropriate studies and analyses shall be performed, including a study of water chemistry modification to reasonably maximize the dissolution and desorption of molybdenum and uranium, to permit the design and implementation of an effective pilot test flushing program.

- c. Prepare a written report describing the findings and conclusions of the initial evaluation and setting forth the plan for a pilot study for an injection and extraction ground water flushing program.

2. Cotter shall design and conduct a pilot study for an injection and extraction ground water flushing program. The pilot study shall include the following:

- a. The pilot study shall be operational for approximately one (1) year;
- b. The pilot study shall include the development of a ground water model of the Old Tailings Ponds Area to predict and evaluate the performance of the ground water flushing program. This model shall include the effects of injection and withdrawal well geometries, well depths, permeabilities, porosity, geochemistry, and other relevant properties of the ground water flushing program. It shall also provide for mass balance calculations.
- c. The pilot study shall also include the development of a ground water flow and

transport model of the mill area and Lincoln Park for use in predicting uranium and molybdenum concentrations at the Lincoln Park Monitoring Well. The model shall include the effects of variable ground-water velocity, hydrodynamic dispersion, chemical retardation and mixing. Current hydrologic data, as supplemented by data collected pursuant to this RAP, are sufficient as input parameters for this model. The model shall be developed using two- or three-dimensional analytical or numerical techniques capable of providing resolution on a scale that is sufficiently fine to accurately characterize the area using standard modeling practice. The geographic coverage of the model shall extend from the hogback south of the mill to the outcrops of Pierre Shale in north central Lincoln Park.

- d. The pilot study shall be performed to allow the testing of design concepts to achieve the ground water quality

objectives stated in Section 14 within sixteen (16) years of the commencement of the production flushing program.

- e. The pilot study shall include a plan to test techniques for modification of the injection water or a substantially equivalent water management system to reasonably maximize dissolution and desorption of molybdenum and uranium;
- f. The upper two (2) feet of soil from the area of old ponds 1, 2 and 6 shall be removed prior to the start of pilot scale operations and disposed in the main and/or secondary impoundment;
- g. Written monthly reports and a final report stating the findings and conclusions of the pilot study and setting forth the plan for a production scale injection and extraction ground water flushing program.

3. Cotter shall design, construct, and operate a production injection and extraction ground water flushing program. The production flushing program shall include the following:

- a. An additional six (6) feet of soil shall be removed from the entire Old Tailings Ponds Area at the time of mill closure and used as the lower strata of the tailings cover in conjunction with final reclamation of the main impoundment. The tailings cover shall meet all applicable requirements, including the requirements of Criteria 1, 4 and 6 of Part III, Schedule E, of the Colorado Radiation Control Regulations, pursuant to an approved final reclamation plan (which is not part of this RAP);
- b. Following the cessation of ground water remedial activities and the interception of ground water at the SCS hydrologic barrier (see Section 9), mean annual concentration of total dissolved solids (TDS) in the Lincoln Park monitoring well shall not exceed 400 mg/l or 1.25 times the average TDS concentration, whichever is least restrictive, for the period 1985 and 1986 at well 123 (the mean concentration at well 123 during this period was 567 mg/l);

- c. The design of the production scale flushing program shall provide for water treatment or a substantially equivalent water management system to reasonably maximize the dissolution and desorption of molybdenum and uranium;
- d. An array of injection and withdrawal wells or trenches designed to flush water through the area identified pursuant to Paragraph 1, Section 8.2 at a rate sufficient to meet remediation goals within sixteen (16) years of the commencement of the production flushing program. The amount of water injected shall be less than the amount of water removed. The flushing system shall be designed to allow flushing to continue throughout the year.
- e. The design, construction, and operation, at approximately the common boundary of Sections 9 and 16, of the 9/16 hydraulic barrier, created by injecting water of a quality which is approved by the State and is compatible with the objectives of this remedial activity into a line of

injection wells, to attain and maintain a ground water hydraulic gradient for flow from this barrier back to the Old Tailings Ponds Area. The existence of this gradient shall be verified by piezometers. The flushing of the area in the southeast quarter of Section 9, north of the hydraulic barrier, will result from or be in conjunction with the construction and operation of the 9/16 hydraulic barrier. An example of the type of conceptual design which would be acceptable to the State would include two lines of piezometers: the piezometers in the first line (Line C) to be drilled at a spacing of 200 feet, or greater spacing as the State may approve, such that each piezometer shall be drilled midway between two adjacent injection wells; the second line of piezometers (Line D) to be drilled south of Line C such that the line drawn between each pair of piezometers (one in each line) shall be perpendicular to Line C; the hydraulic head in each of



the piezometers in Line C to be maintained a minimum 0.2 feet higher than the adjacent piezometer in Line D. The piezometer design and well operation shall be sufficient to demonstrate that, to the maximum extent reasonably achievable, a gradient exists away from the 9/16 hydraulic barrier at all locations.

- f. Monitoring of concentrations of uranium and molybdenum at the perimeter of the Old Tailings Ponds Area shall be conducted to detect movement of these constituents away from the flushing area. If such movement is detected, operation of the flushing system shall be modified to prevent further movement.
- g. Modifications proposed by Cotter in, or made in response to State action upon, each Old Tailings Ponds Area Flushing Annual Report shall be implemented pursuant to an approved schedule.
- h. The further development and updating of the ground water models required by Paragraph 2.b. and c. of Section 8.2.

4. The production flushing program shall continue until either criterion a or b, below, is satisfied:

a. The Lincoln Park ground water quality objectives are met in accordance with the provisions of Sections 8, 9, 12 and 14.1.3; provided that:

- i. Pursuant to the procedures set forth in Section 9.2, Cotter may make application for temporary cessation of the production flushing program and SCS hydrologic barrier at any time that the model described in Paragraph 2.c. of Section 8.2 predicts that the Lincoln Park ground water quality objectives will be met. The State shall approve the initial application absent disagreement with the model prediction;
- ii. Cotter shall then demonstrate by monitoring data, pursuant to Section 12.2.2 and 14.1.3 that the Lincoln Park ground water quality objectives are met.

iii. If the monitoring data demonstrate that the Lincoln Park ground water quality objectives are met, Cotter may permanently cease operations of the production flushing program and SCS hydrologic barrier;

iv. If the monitoring data demonstrate that the Lincoln Park ground water quality objectives are not met, Cotter shall resume operations of the SCS hydrologic barrier, and, unless an application for permanent cessation pursuant to Paragraph 4.b. of this Section has been approved by the State, operation of the production flushing program; or

b. Technological limits have been met, provided that Cotter applies for permanent cessation of the production flushing program when the reasonable technological limits of that program have been met and the State concurs.

8.3 Requisite Assessments and Engineering Activities

Cotter shall prepare and submit to the State for review and approval the following:

1. Plan for initial evaluation which shall include:

- a. Description of actions required by Paragraph 1 of Section 8.2;
- b. Locations of test borings and tests to be performed;
- c. Proposed laboratory studies of geochemical controls and water chemistry modification to reasonably maximize dissolution and desorption of molybdenum and uranium;
- d. QA/QC Plan;
- e. Schedule.

2. Plan for a pilot study of the injection and extraction ground water flushing program, which shall include:

- a. Findings and conclusions of the initial evaluation;
- b. Description of actions;
- c. Design drawings;
- d. Construction specifications;
- e. Proposed concept for modeling the performance of the ground water flushing program and predicting its effectiveness as predicted at the Lincoln Park monitoring well;

- f. Proposed water chemistry modifications;
- g. QA/QC Plan;
- h. Schedule.

3. Written monthly reports on the progress of the pilot study, which shall include:

- a. Water quality data;
- b. Injection and extraction well pumping rates;
- c. Molybdenum dissolution and uranium desorption efficiency;
- d. Results of water chemistry modifications.

4. Application to EPA for an Underground Injection Control (UIC) permit, if required.

5. Plan for a production injection and extraction ground water flushing program including the 9/16 hydraulic barrier, which shall include:

- a. Findings and conclusions of the pilot study;
- b. Description of proposed actions;
- c. Design drawings;
- d. Construction specifications;
- e. Proposed water chemistry modifications;
- f. Ground water model(s) described in Paragraphs 2.b. and c. of Section 8.2 to

evaluate the performance of the ground water flushing program in the Old Tailings Ponds Area and to predict compliance with the ground water quality objectives stated in Section 14;

- g. Operations and maintenance plan;
- h. QA/QC Plan;
- i. Schedule.

6. A written final construction report, which shall include:

- a. As-built drawings;
- b. Explanation of and response to unexpected conditions and problems;
- c. Quality assurance evaluations;
- d. If necessary, modification of the operation and maintenance plan.

7. A written Old Tailings Ponds Area Flushing Annual Report on the progress of the production injection and extraction ground water flushing program, which shall include:

- a. Assessment of chemical extraction efficiency;
- b. Assessment of water injection rates;
- c. Assessment of water chemistry and proposed water chemistry modifications, if any;

- d. Assessment of mass removal;
- e. Assessment of other relevant aspects of the program;
- f. Proposed modifications to the program, including for example, additional injection or extraction wells and alternative pumping rates to optimize the effectiveness of the in-place and existing technology;
- g. An update of the ground water model(s) to include current data and information;
- h. Using the updated ground water model(s), an assessment of the actual program performance compared to the performance necessary to meet the ground water quality objectives stated in Section 14;
- j. Quality assurance evaluations.

8.4 Schedule

Cotter shall design and conduct these remedial activities according to the following schedule:

1. Within sixty (60) days of the entry of a Consent Decree by the Court, Cotter shall submit a plan for the initial evaluation;
2. The State shall act upon the plan for the initial evaluation within sixty (60) days of its receipt;

3. Within two hundred and seventy (270) days of the approval by the State of the plan for the initial evaluation, Cotter shall start and complete the initial evaluation and shall submit to the State a written report stating the findings and conclusions of the initial evaluation and a plan for a pilot study for an injection and extraction ground water flushing program.

4. The State shall act upon the plan for the pilot study within ninety (90) days after its receipt.

5. Within sixty (60) days of the approval by the State of the pilot study and the issuance of any required permits, Cotter shall initiate the pilot study.

6. Cotter shall submit written monthly reports to the State on the progress of the pilot study by the last day of each month following the month for which the report is written.

7. Cotter shall meet with the State, as requested by the State, to review and discuss the progress of the pilot study.

8. The pilot study shall be operational for approximately one (1) year.

9. Within one hundred twenty (120) days of the completion of the pilot study, Cotter shall submit to the State a written report stating the findings and conclusions of



the pilot study and a plan for a production injection and extraction ground water flushing program.

10. The State shall act upon the plan for the production injection and extraction ground water flushing program within ninety (90) days of its receipt.

11. Following the issuance of any required permits, Cotter shall undertake the construction and commence operation of the production injection and extraction ground water flushing program pursuant to the approved schedule.

12. Cotter shall submit a final construction report to the State within sixty (60) days of the completion of the construction of the production injection and extraction ground water flushing facilities.

13. The State shall act upon the final construction report within sixty (60) days of its receipt.

14. Cotter shall submit the Old Tailings Ponds Area Flushing Annual Report to the State on December 15 of each year. This report shall cover activities performed during the period of the previous October 1 through September 30, and any proposed future modifications to the program.

15. The State shall review the performance during the period of the previous October 1 through September 30 and act upon each modification proposed in the Old Tailings Ponds

Area Flushing Annual Report within ninety (90) days of its receipt.

16. Cotter shall submit a written response to the State's action on each Old Tailings Ponds Area Flushing Annual Report for the production injection and extraction ground water flushing program within sixty (60) days of the State's action, and implement approved modifications pursuant to an approved schedule.

9 THE HYDROLOGIC BARRIER AT THE  
SOIL CONSERVATION SERVICE (SCS) DAM

9.1 Description of Operations and Relevant  
Environmental Conditions

In 1972 a flood control dam was completed by the Soil Conservation Service (SCS) on Sand Creek, approximately 0.8 miles north of the area occupied by the mill and the new impoundments. Since the dam's completion, surface runoff and spring flow which emerges upgradient of the dam have been impounded at the dam, and since 1979, the impounded water has been pumped back to the main impoundment.

The pathway of the shallow ground water flow from the mill site is to the north-northeast through a gap in the ridge at the SCS Dam, then north into Lincoln Park. The ground water emerges in springs which flow downstream to the Arkansas River.

9.2 Remedial Activities

The purpose of these remedial activities is to effectively mitigate the flow of mill-derived constituents in the shallow ground water pathway and in conjunction with other ground water remedial activities to achieve the ground water quality objectives stated in Section 14.

Cotter shall perform the following remedial activities:

1. Cotter shall construct, operate and maintain a hydrologic barrier and water withdrawal system at the

upstream side of the SCS Dam on Sand Creek. The following criteria shall apply:

- a. The SCS hydrologic barrier at the SCS Dam shall be constructed according to information and details provided in Section 2 and 6.3, with associated drawings A-1, A-2, B-1, B-2 and B-3 in the "Engineering Report and Design Specifications for Water and Waste Management Plan -- Part 1 at Canon City Mill, Fremont County, Colorado," dated June 29, 1984, Volumes I and II (Engineering Report), and the Supplemental Geotechnical Investigation, dated June, 1985, except as specifically provided below;
- b. The construction area shall be dewatered during construction. Construction shall be considered to have commenced when either excavation or dewatering begins. Contractor dewatering equipment shall be monitored to determine pumping rates and volumes necessary to dewater the construction area. These rates and volumes shall be recorded so that

subsurface flow rates can be estimated and so that the dewatering pump back system can be modified, if necessary;

- c. The SCS hydrologic barrier shall be founded in the shale layer described in the Supplemental Geotechnical Investigation report, dated June, 1985. Upon completion of trench excavation, any significant geological features that require special treatment to provide the intended cutoff contact shall be mapped to a scale and level of detail approved by the State. This together with the foundation testing provided for in Section 6.3.6 of the Engineering Report shall be used to determine any needed foundation treatment or additional excavation requirements. Needed foundation treatment or additional excavation requirements shall be undertaken based on a plan developed by Cotter and approved by the State, pursuant to subparagraphs 2.e. and 2.j. of Section 9.4, prior to placement of

any drain or fill material in the completed excavation.

- d. The upgradient (southerly) trench wall shall be cleaned to remove any condition created by construction activity that impedes ground water inflow into the drain material.
- e. The drain material shall be placed, with prior concurrence of the State, against the upstream trench wall. In those locations where highly permeable zones are encountered, the drain material shall extend upward to the highly permeable zones. The highly permeable zones shall be determined, with State approval, from field inspection.
- f. All excavation area material shall be assayed for radium-226. The concentrations of radium-226 shall be averaged over areas not greater than 100 square meters and over a depth of not more than 15 centimeters. If the excavation area materials exceed the background mean by more than 5 (five) picoCuries of radium-226 per gram, such

material shall not be used for construction, shall not be stockpiled in a manner that represents a source of windblown dust and shall not be mixed with soils containing less than 5 (five) picoCuries of radium-226 per gram above the background mean, and shall not be removed off-site. Such soils shall be handled in accordance with Section 21, On-site Soils.

g. Materials from the Old Tailings Ponds Area shall not be used for SCS hydrologic barrier construction. All clay and random soils used as fill material shall be assayed prior to use. If the materials exceed background mean by more than 5 (five) picoCuries of radium-226 per gram, such materials shall not be used for construction or fill.

h. Preliminary pump operating criteria which would be acceptable to the State are:

<u>Pump Operation</u>	<u>Proposed Water Level Elevation</u>
1st Pump on	5,455
2nd Pump on	5,460

3rd Pump on	5,465
3rd Pump off	5,460
2nd Pump off	5,455
1st Pump off	5,450

These criteria shall be reviewed based on the analysis conducted pursuant to subparagraph j, below. These criteria are intended to minimize hydraulic head on the barrier to the extent practical.

- i. If surface water elevations exceed 5,472 (feet above M.S.L.), and it is apparent that the permanent pumpback system is unable to effectively reduce the pool in a timely manner, as jointly determined by Cotter and the State, emergency pumping shall be implemented to reduce the surface water elevation to below 5,472.
- j. Following barrier construction, Cotter shall conduct sufficient testing to optimize the operation of the pumpback system.
- k. The ground water model required pursuant to Paragraph 2.c. of Section 8.2 shall be updated based on soil and substrate



conditions encountered during construction of the SCS hydrologic barrier.

1. Monitoring the SCS hydrologic barrier shall include monthly water level observations for wells 329, 330, 331, 714, 715, 716 and SCS barrier piezometers for not less than one (1) year after commencement of operation, and semiannually thereafter. Post-construction water level monitoring shall include all wells, piezometer 7, and those piezometers which remain after construction. Additionally, two (2) new piezometers shall be constructed near the crest of the SCS Dam and its extreme right and left spillways.
- m. The pumpback system to the main impoundment or the water distribution pond shall be constructed according to Section 6.4 and drawings C-1, C-2, and C-3 of the Engineering Report.
- n. Quality control and quality assurance shall be according to the Quality Control Plan, dated August 30, 1985 and

as modified and superseded pursuant to paragraph 1(a) through 1(m) of Section 9.2. Additionally, the quality control program shall conform to "Geotechnical Quality Control: Low-Level Radioactive Waste and Uranium Mill Tailings Disposal Facilities," NUREG/CR-3356. The specific plan of action and documentation procedures, including a description of organizational structure, methods and tests for evaluating performance, and notification steps for changes or corrective actions and including reporting, recordkeeping, and storage, shall be revised as appropriate whenever regulatory guidance requiring such revisions is provided to Cotter by the State. The quality control program shall identify who has responsibility for providing test and inspection results to the State.

2. In the event of a request to temporarily cease operations, the hydrologic barrier and water withdrawal system shall continue in operation until Cotter submits and

the State approves a request to temporarily cease these activities as set forth below.

- a. A request to temporarily cease barrier operations may be made based upon a projection that following cessation of SCS hydrologic barrier operations the ground water quality objectives stated in Section 14.1.3 will be met. The State shall approve the initial application to temporarily cease barrier operations absent disagreement with the model prediction. A request to temporarily cease operations shall be made no more than annually.
- b. Operation of the SCS hydrologic barrier and water withdrawal system shall continue until such time that the State preliminarily approves an initial application to temporarily cease operations.
- c. Following preliminary approval by the State of the initial application to cease operations, Cotter shall temporarily cease water withdrawal and cause water from behind the barrier to

bypass the barrier. (See Section 12.2.2.) Monitoring shall occur as provided in Section 14.1.4. If the ground water quality objectives of Section 14.1.3 are met pursuant to the procedure set forth in Section 14.1.4, then the State shall make its preliminary approval of the cessation of operations final. If these ground water quality objectives of Section 14.1.3 are not met, then the operation of the SCS hydrologic barrier and the water withdrawal system shall resume.

3. The SCS hydrologic barrier and water withdrawal system shall continue in operation until either criterion a or b below is satisfied:

- a. The Lincoln Park ground water quality objectives are met in accordance with the provisions of Sections 8, 12 and 14.1.3 and Paragraph 2 of Section 9.2;  
or
- b. The mill has permanently closed and decommissioning has begun and the production flushing program has

permanently ceased operation pursuant to Paragraph 4 of Section 8.2.

4. The outlet works for the SCS Dam shall be unblocked by Cotter in consultation with the Fremont County Flood Conservancy District, after approval by the State to permanently cease operation of the SCS hydrologic barrier and the water withdrawal system.

9.3 Requisite Assessments and Engineering Activities

Cotter shall prepare and submit to the State for review and approval the following:

1. Cotter has submitted to the State designs and specifications for the SCS hydrologic barrier and water withdrawal system.

2. A construction schedule, a protocol for conducting the sampling required pursuant to Paragraphs 1.f. and 1.g. of Section 9.2, and a QA/QC plan for the construction of the barrier.

3. If required by the State, revisions of the proposed design for the SCS hydrologic barrier and water withdrawal system described in the Engineering Report.

4. A report on the results of the testing of the pumpback system operation criteria, which shall include:

- a. Results of testing;
- b. Explanation of and response to any unexpected conditions or problems;

- c. Proposed pumpback operating criteria.
5. A written final construction report, which shall include:
  - a. As-built drawings;
  - b. Explanation of and response to unexpected conditions and problems;
  - c. Quality assurance evaluations;
  - d. Plan for operation and maintenance;
  - e. Soils analysis conducted pursuant to Paragraphs 1.f. and 1.g. of Section 9.2.
6. As a part of the RAP Annual Report specified in Section 3.1, a written annual summary on the operation and maintenance of the SCS hydrologic barrier and water withdrawal system, which shall include:
  - a. Monthly pumping rate;
  - b. Monthly pond storage data;
  - c. Quarterly water chemistry data;
  - d. Explanation of and response to unexpected conditions and problems;
  - e. Quality assurance evaluations;
  - f. A discussion of the effectiveness of the SCS hydrologic barrier;
  - g. Monitoring data required pursuant to Paragraph 1.1. of Section 9.2.

7. Written notice prior to any application to temporarily cease operations, which shall include:

- a. Date application will be filed;
- b. Summary of basis for application.

8. Written application to temporarily cease operations based on a prediction that the ground water quality objectives as stated in Section 14.1.3 will be met, which shall include:

- a. The basis for the application to temporarily cease operations;
- b. All data that are relevant to a cessation of operations;
- c. A projection of the concentrations of uranium and molybdenum at the Lincoln Park Monitoring Well following cessation of barrier operations using the updated ground water model.

9. An application to permanently cease operations after commencement of decommissioning and permanent mill closure in the case where the model predicts that the ground water quality objectives as stated in Section 14.1.3 will not be met shall be submitted at the same time and consistent with the application filed pursuant to Paragraph 4.b. of Section 8.2, which shall include:

- a. All data that are relevant to a cessation of operation of the SCS hydrologic barrier and water withdrawal system;
- b. A projection of the concentrations of uranium and molybdenum at the Lincoln Park Monitoring Well using the updated mill area and Lincoln Park ground water model(s) prepared pursuant to Paragraph 2.b. and c. of Section 8.2.

9.4 Schedule

Cotter shall design and conduct these remedial activities according to the following schedule:

1. Cotter shall submit the information required pursuant to Paragraph 2 of Section 9.3 not later than ten (10) days after entry of the Consent Decree by the Court. The State shall act upon the information submitted within fifteen (15) days of its receipt.

2. SCS Hydrologic Barrier Construction

- a. Within fifteen (15) days of the entry of the Consent Decree by the Court, the State shall review and act upon the proposed plan for the SCS hydrologic barrier and water withdrawal system as



previously submitted to the Colorado Department of Health by Cotter.

- b. If the review and action by the State requires substantial changes in the proposed design, then within one hundred and twenty (120) days of the action of the State, Cotter shall prepare and submit a revised plan and schedule for the SCS hydrologic barrier and water withdrawal system.
- c. The State shall act upon the revised plan and schedule within thirty (30) days of receipt;
- d. Construction of the SCS hydrologic barrier and withdrawal system shall be conducted in accordance with the approved schedule, and be completed not later than November 1, 1988.  
Construction will not be required to commence during the months of August through May.
- e. During barrier construction, Cotter shall verbally notify the State not less than three (3) working days prior to

completion of trench excavation and commencement of:

- i. Grouting;
  - ii. Barrier material placement and compaction;
  - iii. Drain material placement.
- f. The State shall inspect on the date specified in the verbal notice provided pursuant to Subparagraph e of this Paragraph.
- g. Cotter shall submit the report on the results of the pumpback operation testing conducted pursuant to paragraph 1.j. of Section 9.2 within three hundred sixty (360) days after the commencement of water withdrawal operations.
- h. The State shall act on the report within sixty (60) days of its receipt.
- i. Cotter shall construct the piezometers required pursuant to Paragraph 1.1. of Section 9.2 in accordance with the construction schedule approved pursuant to Paragraph 2.d. of Section 9.4.
- j. The State shall provide decisions regarding the items listed in

subparagraph e of this Paragraph, within twenty-four (24) hours of the State's field inspection.

k. Cotter shall submit a final construction report to the State within one hundred twenty (120) days of the completion of the construction of the SCS hydrologic barrier and water withdrawal system.

l. The State shall act upon the final construction report within one hundred twenty (120) days of its receipt.

3. Annual Report

a. Following completion of the construction of the SCS hydrologic barrier, as part of the RAP Annual Report specified in Section 3.1, Cotter shall submit to the State an annual summary of the operation of the SCS hydrologic barrier and its related pumpback system.

b. The State shall act upon the annual report within one hundred twenty (120) days of its receipt.

4. Application to terminate operation of the SCS hydrologic barrier and water withdrawal system.

- a. In the event of an application to temporarily cease operation pursuant to Sections 8.2 and 9.2, Cotter shall give thirty (30) days written notice to the State prior to submitting a written application to temporarily cease operation of the SCS hydrologic barrier and water withdrawal system. The State shall act upon the application within one hundred and twenty (120) days of its receipt.
- b. In the event of a request to permanently cease operations pursuant to Paragraph 3 in Section 9.2, Cotter shall submit an application for permanent cessation of operations as described in Paragraph 9 of Section 9.3. The State shall act upon the application submitted by Cotter within one hundred and twenty (120) days of its receipt.

## 10 NORTHWEST AND NORTHEAST SHALLOW GROUND WATER PATHWAYS

### 10.1 Description of Operations and Relevant Environmental Conditions

The major pathway of the shallow ground water flow is to the north-northeast from the mill area through a gap in the ridge at the SCS Dam into Lincoln Park. The State suspects that other shallow ground water pathways may exist. One suspected pathway may be from the site to the northwest and another may be from the site to the northeast.

### 10.2 Remedial Activities

The purpose of these remedial activities is to determine the existence of hydrologic divides, if any, through the west one-half of Section 9 and along the east section line of Section 9, to monitor the water quality in these locations, based on these water quality data, to determine whether either or both of these pathways of shallow ground water flow to the northwest and northeast exist, if necessary, to effectively minimize and mitigate these pathways as routes of shallow ground water flow, and in conjunction with other ground water remedial activities to achieve the ground water quality objectives stated in Section 14. Continued monitoring and possible remediation of these areas is required because of the potential for remedial activities at other areas, specifically, flushing in the Old Tailings Ponds Area, which might affect the water quality in these locations.

Cotter shall perform the following remedial activities:

1. Cotter shall design, and implement a well monitoring plan to determine whether hydrologic divides exist through the west 1/2 of Section 9 (northwest) and approximately along the east Section line of Section 9 (northeast).

The monitoring wells shall be drilled at the locations indicated on Figure 10-1. The Class A well at or near proposed well 009 shall be completed as two holes. One hole (009) shall be completed to a depth of fifty (50) feet and the other hole (014) shall be completed to a depth of one hundred (100) feet. The Class A well (015) at or near present well 342 shall be completed to a depth from five (5) feet above the then existing water table to twenty (20) feet below the then existing water table. The Class A well north of the southeast (SE) corner of Section 9 shall be completed as two holes. One hole (016) shall be completed to a depth from the then existing water table to twenty-five (25) feet below the then existing water table, and the other hole (017) shall be completed to a depth from thirty-five (35) feet below the then existing water table to sixty (60) feet below the then existing water table. All seven (7) Class B wells shall be completed to be open from the water table to a depth of thirty (30) feet below the water table.

Water quality and water levels shall be monitored for a one-year monitoring period beginning ninety (90) days after the wells are drilled to allow for stabilization of water quality and water level condition, and monitored according to Section 15.

2. Following a one year monitoring period, Cotter shall analyze the accumulated data and report to the State its conclusions as to whether either of the hydrologic divides exist.

3. If a hydrologic divide is determined to exist for the suspected northwest or northeast pathway, then Cotter shall continue monitoring the newly installed Class A wells and after the collection of a minimum of two years water quality data, perform an analysis of water quality data obtained from the identified Class A wells along the pathway(s) to determine if there is a steady state condition or if there is a trend of increased molybdenum concentration. Monitoring shall continue until Old Tailings Pond Area flushing operations are complete. The protocol to determine whether there is a steady state condition is that identified in Section 3.2.7. The monitoring data to be used are the most recent data for the concentration of molybdenum for each of the identified Class A wells for a period not less than two (2) years and not more than five (5) years. This analysis shall be performed annually by Cotter. Specifically, a total

of at least two years of data must be accumulated prior to conducting the analysis, then the analysis shall be conducted annually on the accumulated monitoring data until a total of five years of data are collected. Analyses conducted in subsequent years must use only the most recent five years of data. If a steady state condition does not exist and if there is a statistically significant upward trend, as defined in Section 3.2.7, of increasing molybdenum concentrations, then Cotter shall conduct remediation as described in Paragraph 5, below.

4. If a hydrologic divide is determined not to exist for the suspected northwest or northeast pathway, then Cotter shall perform a statistical analysis of the monitoring data obtained from the Class A wells located along the suspected pathway(s) to determine whether the concentrations of molybdenum in any of the Class A wells (Figure 10-1) exceed the background range of molybdenum. The comparison of the monitoring data with the background range shall be performed by use of the protocol identified in Section 3.2.6. The background data shall be all of the data collected after July 1984 for the concentration of molybdenum at wells 325 and 337. The monitoring data for each indicated Class A well shall be the most recent data for the concentration of molybdenum in each indicated Class A well for a period not less than one (1) year and not more than two (2) years. Specifically, the



analysis must be conducted on no less than one year of accumulated monitoring data and no more than two years of accumulated monitoring data, thus subsequent analyses shall be conducted using only the most recent two years of data. If the statistical analysis indicates that the concentration of molybdenum in the monitoring data in any of the indicated Class A wells along the suspected pathway(s) exceeds the background range of molybdenum, Cotter shall conduct further remediation as described in Paragraph 5 of Section 10.2.

5. If Cotter is required to conduct remediation pursuant to Paragraph 3 or 4 of this Section, Cotter shall conduct additional appropriate investigations, and design and submit a proposal and construction schedule for a remediation program to effectively minimize and mitigate the pathway(s) of ground water flow.

10.3 Requisite Assessments and Engineering Activities

Cotter shall prepare and submit to the State for review and approval the following:

1. A well monitoring plan, which shall include:
  - a. Design drawings;
  - b. Construction specifications;
  - c. QA/QC Plan;
  - d. Schedule.
2. A written report stating the findings and conclusions regarding the existence of hydrologic divides, which shall include:

- a. As built drawings;
- b. Explanation of and response to unexpected conditions and problems;
- c. Quality assurance evaluations;
- d. Statistical analysis of data, including statistical analysis of molybdenum concentrations if a hydrologic divide does not exist.

3. A written annual summary, which shall

include:

- a. If a hydrologic divide(s) exists, the monitoring and background data and statistical analysis for a steady state condition for the identified Class A wells;
- b. If a hydrologic divide(s) does not exist, a statistical comparison of the monitoring and background data sets;
- c. Explanation of and response to unexpected conditions and problems;
- d. Quality assurance evaluations;
- e. Conclusions;
- f. Description of remediation activities, if any, as described in Paragraph 5 of Section 10.2.

4. If Cotter is required to conduct remediation, pursuant to Paragraph 3 or 4 of Section 10.2, Cotter shall submit a report which shall include:

- a. All data and analyses relevant to the definition of the pathway;
- b. Design drawings and construction specifications for the proposed remediation facilities;
- c. Schedule for the construction and operation of the proposed remediation facilities;
- d. QA/QC plan;
- e. Operations and maintenance plan.

5. If Cotter is required to conduct remediation, a written final construction report, which shall include:

- a. As-built drawings;
- b. Explanation of and response to unexpected conditions and problems;
- c. Quality assurance evaluations;
- d. If necessary, any modifications of the operation and maintenance plan.

10.4 Schedule

Cotter shall conduct these remedial activities according to the following schedule:

1. Within sixty (60) days of the entry of the Consent Decree by the Court, Cotter shall submit a well monitoring plan.

2. The State shall act upon the well monitoring plan within sixty (60) days of its receipt.

3. Cotter shall implement the well monitoring plan pursuant to the approved schedule, but not later than two hundred seventy (270) days after receiving approval from the State.

4. Within sixty (60) days following one (1) year of monitoring all of the Class A and Class B wells at the locations indicated in Paragraph 1 of Section 10.2, Cotter shall submit a written report to the State on the findings and conclusions regarding whether hydrologic divide(s) exist and the statistical analysis of the molybdenum concentrations, if the report concludes that a hydrologic divide does not exist.

5. The State shall act upon the report regarding whether the hydrologic divides exist within sixty (60) days of its receipt.

6. Cotter shall submit as part of the RAP Annual Report specified in Section 3.1, a written annual summary as described in Paragraph 3 of Section 10.3.

7. The State shall act upon the annual summary within one hundred twenty (120) days of its receipt.

8. Within three hundred sixty (360) days of the determination that remediation is required pursuant to Paragraph 3 or 4 of Section 10.2, Cotter shall conduct additional appropriate investigations, and design and submit a proposal and construction schedule for a remediation program to effectively minimize and mitigate the pathway(s) of ground water flow.

9. The State shall act upon the migration pathway plan within ninety (90) days of its receipt.

10. If permits are required, Cotter shall submit the permit applications to the appropriate authorities at the time Cotter submits the migration pathway plan to the State.

11. Cotter shall initiate the migration pathway plan and start the necessary construction pursuant to the approved schedule.

12. Cotter shall submit a final construction report to the State within ninety (90) days of the completion of the implementation of the migration pathway plan.

13. The State shall act upon the final construction report within sixty (60) days of its receipt.

## 11 WOLF PARK MINE SHAFT

### 11.1 Description of Operations and Relevant Environmental Conditions

The Wolf Park coal mine last operated beneath Section 16 in the early 1900's. The mine included a shaft approximately 1084 feet deep, and located as shown on Figure 11-1.

### 11.2 Remedial Activity

The purpose of these remedial activities is to investigate the Wolf Park Mine Shaft as a pathway of flow to deep ground water, to effectively minimize and mitigate the mine shaft as a pathway, if the pathway is determined to exist, and, in conjunction with the other ground water remedial activities, to achieve the ground water quality objectives stated in Section 14.

Cotter shall perform the following remedial activities:

1. Cotter shall install and maintain a well (018) within twenty-five (25) feet of the mine shaft. The well shall be located between the shaft and the Old Tailings Ponds Area, unless Cotter demonstrates that an alternative location is suitable and said location is acceptable to the State. The well shall be completed to Class A well standards (see Section 3.2.1), and its sampling interval shall be between one hundred and forty (140) feet and one hundred and seventy (170) feet below the ground surface.

2. Water samples shall be collected from the monitoring well once a month for one (1) year following the completion of the installation of the well. Water sample collection shall commence ninety (90) days after well installation to allow for stabilization of water quality and water level conditions in the well. The sampling shall be completed prior to the start of the flushing of the Old Tailings Ponds Area in any location that has significant potential to create changed chemical conditions in the mine shaft or in the open interval of the well. Each water sample shall be analyzed for molybdenum.

3. The data obtained shall be evaluated to determine if the mean concentration of molybdenum exceeds the background range. The background data shall be the concentrations of molybdenum in existing well 324 after July 1984.

4. If the mean concentration of molybdenum in the monitoring well exceeds the background range of molybdenum during the first year of monitoring, then Cotter shall design, install and maintain a cement grout plug or an appropriate equivalent. A plan for the plug shall be submitted to the State for review and approval. The plug shall be designed to effectively minimize and mitigate flow from the formation above two hundred and forty (240) feet below the surface of the ground to the lower portion of the mine shaft and may be

accomplished either by installing a low permeability plug in the mine shaft at an approved location above two hundred and forty (240) feet below the surface of the ground or by grouting the rock surrounding the mine shaft in the interval between one hundred and forty (140) feet and two hundred and forty (240) feet below the surface of the ground.

5. If the concentration of molybdenum in the monitoring well does not exceed the background range of molybdenum, during the one (1) year monitoring period, then monitoring of the well or remedial action with respect to the Wolf Park mine shaft shall continue on a quarterly basis until the flushing program in the Old Tailings Ponds Area is permanently terminated. If the molybdenum concentration in the well exceeds the background range as determined in Paragraph 3, above, Cotter shall submit a proposed remediation program to minimize and mitigate the condition inducing the increased concentration.

11.3 Requisite Assessments and Engineering Activities

Cotter shall submit to the State for review and approval the following:

1. Plan and schedule for construction of the monitoring well, including appropriate QA/QC.
2. A written final construction report for the monitoring well, which shall include:
  - a. As-built drawings;



- b. Explanation of and response to unexpected conditions and problems;
- c. Quality assurance evaluations;
- d. Monitoring plan.

3. Monitoring results report, which shall

include:

- a. The results of the sampling and analysis of the water samples of the new shaft monitoring well and well 324;
- b. An analysis of whether the levels of molybdenum in the monitoring well exceed the background range of molybdenum;
- c. Quality assurance evaluations.

4. If a cement grout plug or equivalent is required pursuant to Paragraph 4 of Section 11.2, then a written remediation plan shall be submitted, which shall

include:

- a. The design drawings and construction specifications for the plug or equivalent;
- b. A construction schedule for its installation;
- c. QA/QC Plan;
- d. Maintenance plan.

5. If a cement grout plug or equivalent is required pursuant to Paragraph 4 of Section 11.2, then a written final construction report shall be submitted which shall include:

- a. As-built drawings;
- b. Explanation of and response to any unexpected conditions or problems.

6. If a remediation program is required pursuant to Paragraph 5 of Section 11.2, then a written remediation plan shall be submitted, which shall include:

- a. Design drawings and construction specifications;
- b. Construction schedule;
- c. QA/QC Plan;
- d. Maintenance Plan.

7. If a remediation program is required pursuant to Paragraph 5 of Section 11.2, then a written final construction or implementation report shall be submitted which shall include:

- a. As-built drawings;
- b. Explanation of and response to any unexpected conditions or problems.

11.4 Schedule

Cotter shall design and conduct these remedial activities according to the following schedule:

1. Within sixty (60) days of the entry of a Consent Decree by the Court, Cotter shall submit the plan for construction of the monitoring well for State review and approval.

2. The State shall act upon the plan and schedule within sixty (60) days of its receipt.

3. Cotter shall complete the installation of the monitoring well in accordance with the approved schedule.

4. Within one hundred twenty (120) days of installation of the monitoring well, Cotter shall submit a final construction report.

5. The State shall act upon the final construction report within one hundred twenty (120) days of its receipt.

6. The well shall be monitored monthly for one (1) year beginning ninety (90) days after its installation and, if a plug or equivalent is not installed, quarterly thereafter until the Old Tailings Ponds Area flushing program is terminated.

7. Within sixty (60) days of the completion of the first year of monitoring, Cotter shall submit a monitoring results report. The results of any subsequent monitoring shall be reported as part of the RAP Annual Report as specified in Section 3.1.

8. The State shall act on the monitoring results report of the first year of monitoring data within thirty (30) days of receipt. The State shall act upon subsequent monitoring results reported in the RAP Annual Report within one hundred twenty (120) days of the receipt of the annual report.

9. If a cement grout plug or equivalent is required pursuant to Section 11.2:

- a. Cotter shall submit a plan and schedule for the cement grout plug or appropriate equivalent within sixty (60) days of the action by the State on the monitoring results report;
- b. The State shall act on the plan and schedule for a cement grout plug or equivalent within thirty (30) days of its receipt;
- c. Cotter shall complete construction of the cement grout plug or equivalent pursuant to the schedule set forth in the plan as approved;
- d. Cotter shall submit to the State a final construction report within thirty (30) days of the completion of the

construction of the cement grout plug or equivalent;

- e. The State shall act upon the final construction report within sixty (60) days of its receipt.

10. If a remediation program is required pursuant to Paragraph 5 of Section 11.2:

- a. Cotter shall submit a remediation plan and schedule within sixty (60) days of submitting the RAP Annual Report.
- b. The State shall act on the plan and schedule for the remediation program within sixty (60) days of its receipt.
- c. Cotter shall complete the remediation program pursuant to the approved schedule.
- d. Cotter shall submit to the State a final construction report within thirty (30) days of the completion of the construction or implementation of the remediation program.
- e. The State shall act upon the final construction report within sixty (60) days of its receipt.

12 SOIL CONSERVATION SERVICE (SCS) DAM  
TO THE DEWEESE DYE DITCH

12.1 Description of Operations and Relevant  
Environmental Conditions

The major pathway of shallow ground water flow is through a gap in the ridge at the SCS Dam. The ground water flows along the Sand Creek channel to the DeWeese Dye Ditch. During the irrigation season the ditch serves as a source of ground water dilution.

12.2 Remedial Activities

12.2.1 Flushing Activities

The purpose of these remedial activities is to flush the ground water in the Sand Creek channel between the SCS dam and the DeWeese Dye Ditch so as, in conjunction with other ground water remedial activities, to achieve the ground water quality objectives stated in Section 14. In order to accomplish this purpose, Cotter shall perform the following remedial activities:

1. Cotter shall design and implement a plan to flush the ground water along the Sand Creek channel from the SCS Dam to the DeWeese Dye Ditch. Water, of a quality which is approved by the State and is compatible with the goals of this remedial activity shall be injected either by wells or by a trench located in close proximity to the downstream edge of the SCS Dam. The rate of flushing shall be sufficient to raise the ground water in the Sand Creek channel from the SCS

Dam to the DeWeese Dye Ditch to an elevation at or above the water level elevations existing prior to the start of the pumpback operations at the SCS Dam in 1979, but the rate of flushing is not required to be greater than one hundred (100) gallons per minute (gpm). The Sand Creek channel flushing program shall operate seasonally during that period of time when the DeWeese Dye Ditch is delivering water.

2. The flushing program shall operate until the ground water quality at the Lincoln Park Monitoring Well first achieves the objectives stated in Section 14.1.3, but in no event for less than one (1) year, or until the SCS hydrologic barrier ceases operation pursuant to Paragraph 2 or 3 of Section 9.2, whichever is earlier.

12.2.2 Testing Activities

The purpose of the testing activities is to determine whether the Lincoln Park ground water quality objectives can be satisfied after cessation of SCS hydrologic barrier operations.

In order to accomplish this purpose, Cotter shall perform the following testing activities:

1. In accordance the procedures specified in Paragraph 2 of Section 9.2, Cotter shall cause the water impounded upgradient and upstream of the SCS hydrologic barrier to be injected by well or trench downgradient of the SCS Dam.

2. This injection procedure shall be conducted as an element of the compliance evaluation described in Section 14.1.4.2.

12.3 Requisite Assessments and Engineering Activities

12.3.1 Flushing Activities

Cotter shall prepare and submit to the State for review and approval the following:

1. A plan to flush the ground water in the Sand Creek channel from the SCS Dam to the DeWeese Dye Ditch, which shall include:

- a. Design drawings and construction specifications;
- b. QA/QC Plan;
- c. Construction schedule and conceptual operation schedule;
- d. Operations and maintenance plan;
- e. Permit applications, if required;
- f. Water withdrawal quantity information collected after the initiation of the SCS hydrologic barrier and water withdrawal system operations. (This information will be incorporated into design of the flushing proposal.)

2. A written final construction report, which shall include:



- a. As-built drawings;
  - b. Explanation of and response to unexpected conditions and problems;
  - c. Quality assurance evaluations;
  - d. Plan for operation and maintenance.
3. A written annual report, which shall include:
    - a. Description of operations, including rate of flushing;
    - b. Explanation of and response to unexpected conditions and problems;
    - c. Quality assurance evaluations.

12.3.2 Testing Activities

Cotter shall prepare and submit to the State for review and approval the following:

1. A plan to inject the water stored upstream and upgradient of the SCS hydrologic barrier in the Sand Creek channel downgradient from the SCS Dam following State approval of Cotter's initial application to cease barrier operations which shall include:

- a. Design drawings and construction specifications;
- b. QA/QC Plan;
- c. Construction schedule and conceptual operation schedule;
- d. Operations and maintenance plan;

- e. Permit applications, if required.
2. A written final implementation report, which shall include:
  - a. As-built drawings;
  - b. Explanation of and response to unexpected conditions and problems;
  - c. Quality assurance evaluations;
  - d. Plan for operation and maintenance.
3. The Annual Report for this activity shall be as described in Paragraph 3 of Section 12.3.1.

12.4 Schedule

12.4.1 Flushing Activities

Cotter shall design and conduct these remedial activities according to the following schedule:

1. Within one hundred and eighty (180) days after the completion of construction of the SCS hydrologic barrier and the start of the pumpback operations at the SCS hydrologic barrier, Cotter shall submit to the State a plan to flush the ground water in the Sand Creek channel from the SCS Dam to the DeWeese Dye Ditch.
2. The State shall act upon the plan within ninety (90) days after its receipt.
3. Cotter shall apply to EPA for an Underground Injection Control (UIC) permit, if required, and for any other

required permits to the appropriate State or federal agency within ninety (90) days of approval of the plan by the State.

4. Construction activities shall be completed by Cotter according to the approved construction schedule, and the flushing system shall be operated seasonally during that period of the year when the DeWeese Dye Ditch is delivering water.

5. Cotter shall submit a final construction report within one hundred twenty (120) days after the completion of construction.

6. The State shall act upon the final construction report within sixty (60) days of its receipt.

7. As a part of the RAP Annual Report specified in Section 3.1, Cotter shall submit an annual activities summary after entry of the Consent Decree and after the completion of construction.

8. The State shall act upon the annual report within one hundred twenty (120) days of its receipt.

12.4.2 Testing Activities

1. Cotter shall implement the provisions of Section 12.2.2 pursuant to the Schedule set forth in Paragraph 4 of Section 9.4.

2. The State shall act on the plan submitted under Section 12.3.2 pursuant to the schedule set forth in Paragraph 4 of Section 9.4.

## 13 LINCOLN PARK WATER USE

### 13.1 Description of Operations and Relevant Environmental Conditions

The major pathway of shallow ground water flow from the mill northward into Lincoln Park is through the gap in the hogback occupied by the SCS Dam. The Canon City water district serves the Cotter mill and the Lincoln Park area. The majority of residences in Lincoln Park currently use the Canon City water supply for drinking water purposes through a direct connection; a number of residences use water from wells on their property either in addition to their Canon City water tap or as their sole supply. Some residences still use well water for stock watering and/or irrigation.

### 13.2 Remedial Activities

The purpose of these remedial activities is to further determine the extent of ground water use by Lincoln Park residents, to connect any unconnected drinking water users in the Lincoln Park Water Use Survey Area to the Canon City water supply pursuant to Paragraphs 4 and 7 of this Section, in conjunction with the Health Risk Assessment (see Section 32), to develop guidelines for the use of the ground water for irrigation and stock watering, and, as appropriate, to protect agricultural, ground water uses.

Cotter shall perform the following remedial activities:

1. Cotter shall design and implement a water use survey for the Lincoln Park Water Use Survey Area, which is shown on Figure 13-1. The survey shall be designed with the participation of the State and the Health Risk Assessment Panel and submitted to the State for review and approval. The State-approved survey shall be conducted by individual personal interview, or other reasonable combination of alternatives, including by way of example, telephone survey, mail survey or use of data collected by the U.S. Geological Survey and the Canon City Water Department of all of those within the area of Lincoln Park Water Use Survey Area. The State shall be given the opportunity to participate in each interview.

Each location where well water is used or is available for use, and the well has not been abandoned shall be included in the survey. A well shall be considered abandoned if the property is vacant, the well or pump is inoperative, or the well has been plugged.

The survey shall:

- a. Determine the source(s) of water available to each location within the survey area;
- b. Determine the historic use of ground water as of June 12, 1987, and current use of each source of ground water;

- c. Collect a water sample of each source of ground water;
- d. Analyze each water sample for concentrations of uranium and molybdenum.

2. Following the survey, Cotter shall report the survey and sample results to the State and the Health Risk Assessment Panel, and on the basis of guidance from the State and the Health Risk Assessment Panel propose a discussion with each person from whose property a sample was collected.

3. Cotter shall design and implement a program to disseminate relevant information obtained by the water use survey, including water sample results, water uses, and guidelines for water use. The program shall be designed with the participation of the State and Health Risk Assessment Panel. Following State approval, the program shall be implemented with the participation of the State and the Health Risk Assessment Panel.

4. Following the survey, Cotter shall offer each residence in the survey area, which is not connected to the Canon City water supply, a connection to the Canon City water supply. Each connection shall be made at the sole expense of Cotter.

5. On the basis of the survey and the Health Risk Assessment, if it is determined by the State that the

ground water is not appropriate for irrigation or stock watering, Cotter shall offer each agricultural user of ground water in the survey area who has a legal right to use that ground water, an alternative water supply. This obligation shall be limited to those agricultural water uses in existence, or for which a water, land use or other relevant application had been filed and was pending as of June 12, 1987. Each alternative water supply shall be supplied at the sole expense of Cotter.

6. As approved by the State, Cotter shall pay the incremental costs, if any, resulting from the replacement of ground water supplies, pursuant to Paragraph 4, 5 or 7 of this Section and the implementation of the water use recommendations of the Health Risk Assessment Panel. This incremental cost obligation shall be in effect during the period prior to the establishment of ACLs pursuant to Section 14 when uranium and molybdenum concentrations exceed:

- a. For residences, an annual average of 0.035 mg/l and 0.1 mg/l, respectively, as measured at the Lincoln Park Monitoring Well; or
- b. For agricultural uses in existence, or for which a water, land use or other relevant application had been filed and was pending as of June 12, 1987,

guidelines for those uses as recommended by the Health Risk Assessment Panel and approved by the State for each agricultural use well.

7. Cotter shall have a continuing obligation to make future connections to the Canon City water supply when:

- 1) a proposed water user is entitled by all applicable laws to install a well;
- 2) for a proposed drinking water well, when the water quality in the Lincoln Park Monitoring Well exceeds an annually averaged concentration of 0.035 mg/l or 0.1 mg/l uranium and molybdenum, respectively;
- 3) for a proposed agricultural use well, when the water quality in that well exceeds the State-approved guidelines applicable to the proposed use, as recommended by the Health Risk Assessment Panel and approved by the State pursuant to Section 32; and,
- 4) when the proposed well is located within the Lincoln Park Water Use Survey Area. This obligation is suspended when the annually averaged uranium and molybdenum concentrations at the Lincoln Park Monitoring Well are less than 0.035 mg/l and 0.1 mg/l, respectively. This obligation shall permanently cease when it has been determined that the ground water quality objectives at the Lincoln Park Monitoring Well have been met pursuant to Section 14, or alternate concentration limits (ACL's) are established pursuant to Section 14.



13.3 Requisite Assessment and Engineering Activities

Cotter shall submit to the State for review and approval the following:

1. A plan for the Lincoln Park water use survey, which shall include:

- a. Complete list of locations to be surveyed;
- b. Proposed survey methods;
- c. QA/QC Plan for sampling and analysis;
- d. Schedule;
- e. Ground Water Use Survey questionnaire.

2. A written report of the results of the survey, which shall include:

- a. Locations surveyed;
- b. Ground water uses;
- c. Water sample results;
- d. Proposed ground water use standards;
- e. Proposed guidelines for ground water use.

3. A plan to disseminate the relevant information obtained by the water use survey, which shall include:

- a. Information to be disseminated, including ground water uses, water

sample results, relevant guidelines for water use;

- b. Methods for information dissemination;
- c. Schedule.

4. A written annual summary on the replacement of ground water supplies, which shall include:

- a. Each location eligible, pursuant to Paragraphs 4 and 5 of Section 13.2, to have an alternative source of water;
- b. Each such location offered a connection to the Canon City water supply and/or an alternative source of water;
- c. The source of water for each water supply provided and the date such supply was made available;
- d. The reason any eligible property was not supplied with a connection to the Canon City water supply and/or an alternative source of water;
- e. If applicable, the plan to pay incremental costs incurred by use of a connection to the Canon City water supply and/or an alternative source of water;
- f. Schedule for future connection, if any.

13.4 Schedule

Cotter shall conduct these remedial activities according to the following schedule:

1. Within one hundred fifty (150) days after the entry of the Consent Decree by the Court, Cotter shall submit to the State a design for a water use survey plan.

2. The State shall act upon the water use survey plan within sixty (60) days of its receipt.

3. By no later than March 1, 1989, Cotter shall complete the water use survey.

4. Within one hundred twenty (120) days of the completion of the water use survey, Cotter shall submit a written report to the State on the survey results, a plan for information dissemination, and a schedule for water connections, if any.

5. The State shall act upon the water-use survey report, the plan for information dissemination and schedule for any water connections within sixty (60) days of their receipt.

6. Within sixty (60) days of the approval by the State of the information dissemination plan and schedule, Cotter shall implement the plan.

7. Pursuant to the schedule set forth in Paragraph 4 above, Cotter shall, as determined necessary by

the State, make or have made any necessary residential connections to the Canon City water supply.

8. Within sixty (60) days of the determination made by the State pursuant to Paragraph 5 of Section 13.2, Cotter shall submit a plan and schedule to replace, as required by the State, any necessary ground water supplies used for irrigation or stock watering with appropriate alternative water supplies.

9. Within sixty (60) days of its receipt, the State shall act upon the replacement plan and schedule.

10. Cotter shall implement the plan in accordance with the approved schedule.

11. Any future residential connections to the Canon City water supply and any future replacement of irrigation or stock watering supplies shall be made or caused to be made by Cotter according to an approved schedule for these future activities.

12. Cotter shall submit as part of the RAP Annual Report specified in Section 3.1, a written annual summary as described in Paragraph 4 of Section 13.3.

## 14 GROUND WATER COMPLIANCE

### 14.1 Description of Operations and Relevant Environmental Conditions

#### 14.1.1 Objectives

This section describes how attainment of the ground water quality objectives will be determined, and how alternate concentration limits (ACL's) will be established.

#### 14.1.2 Cotter Site Ground Water Protection

The methodology which will be employed includes the use of ground water quality objectives to be measured at <sup>to</sup> designated monitoring well<sup>s</sup> in Lincoln Park. Concentration objectives have been established (see Section 14.1.3) for the two constituents of concern, uranium and molybdenum. These concentration objectives have been determined to be protective of human health, welfare, and the environment. These concentration objectives are predicted to be technically feasible and as low as reasonably achievable.

#### 14.1.3 Lincoln Park Ground Water Quality Objectives

The ground water quality objectives established for uranium and molybdenum at the Lincoln Park Monitoring Well (located pursuant to Paragraph 1 of Section 14.2) are not more than the average concentration of 0.035 mg/liter of uranium and 0.1 mg/liter of molybdenum, calculated using the method described below. The uranium objective is the same as the drinking water recommendation for uranium by the National

Academy of Science and the molybdenum objective is the adjusted average daily intake (AADI) value proposed by the U.S. Environmental Protection Agency.

14.1.4 Testing and Analysis

14.1.4.1 Transit Time

1. Temporary cessation of SCS hydrologic barrier operation shall not occur until cessation of operations of each of:

- a. Flushing operations at the Old Tailings Ponds Area;
- b. The SCS Dam to DeWeese Dye Ditch flushing operation.

With respect to the temporary cessation of SCS hydrologic barrier operation described in Paragraph 2 of Section 9.2, the transit time for ground water to flow from behind the SCS Dam to Lincoln Park Monitoring Well shall be determined by the following procedure.

2. Once the SCS hydrologic barrier operations have ceased, a linear regression procedure as described in Section 14.1.4.2 shall be used to determine when there is no longer a significant upward trend in the flux of both uranium and molybdenum at the Lincoln Park Monitoring Well. A measure of flux shall be calculated according to the following procedure or other State approved procedure:

- a. Cotter shall propose locations for two piezometers approximately 300 feet apart and each approximately 300 feet from the Lincoln Park Monitoring Well, so that the two <sup>piezometers</sup> wells and the Lincoln Park Monitoring Well form an approximate equilateral triangle. To the extent possible, the piezometers and the Lincoln Park Monitoring Well shall also be located so that water levels in each are not unduly affected by pumpage of nearby wells.
- b. Following approval by the State, Cotter shall drill the piezometers to a depth great enough to penetrate to the Vermejo Formation, so that the depth to the contact between the Vermejo and overlying alluvial deposits is known. The wells shall then be plugged back to the contact. The piezometers shall be constructed using casing slotted throughout the alluvial material, except that the upper 5 feet of each well shall be grouted. Locations of the wells shall be determined by a qualified

surveyor, with the elevation of the measuring point determined to the nearest one-hundredth of a foot.

- c. At the same time that water samples are collected from the Lincoln Park Monitoring Well, Cotter shall also measure depth to water in the Monitoring Well and the two piezometers. In the Monitoring Well, depth to water shall be measured prior to collecting the sample or purging the well.
- d. The hydraulic gradient at the time of sampling shall be calculated from the hydraulic heads (relative to sea level), and the locations of the three wells. *f piezometers*
- e. The average saturated thickness in the vicinity of the Lincoln Park Monitoring Well shall be calculated by averaging, the saturated thickness of alluvial materials (estimated by hydraulic head minus elevation of the Vermejo-Alluvial contact) for each of the three wells. *f piezometers*
- f. The measures of uranium and molybdenum flux shall be calculated by multiplying the concentration of each by the average



the concentration of each by the average saturated thickness and the magnitude of the hydraulic gradient.

14.1.4.2 Lincoln Park Compliance Testing

Compliance testing (i.e., comparison to numerical objectives for uranium and molybdenum) shall be performed using the data from each of the two wells comprising the Lincoln Park Monitoring Well separately. The monthly data for the most recent three-year period after the measures of flux begin to increase shall be used in the statistical analysis. When the slopes of both regression lines (time being the independent variable and fluxes of uranium and molybdenum being the dependent variables) are no longer greater than zero (a one-tailed t-test at a 95 percent confidence level) at one of the two wells comprising the Lincoln Park Monitoring Well, the water from behind the SCS Dam shall be determined to have reached the Lincoln Park Monitoring Well and comparison of water quality against the objectives for uranium and molybdenum shall be performed. Concentrations of these constituents measured in samples collected over the last 24 months of the three year period shall be averaged, and the respective average compared against the numerical objective. In the event that the averages of both molybdenum and uranium are equal to or less than the respective objectives in both of the two wells comprising the Lincoln Park Monitoring Well,

approval for permanent cessation of Old Tailings Ponds Area flushing and SCS hydrologic barrier operations pursuant to Sections 8.2 and 9.2, respectively, shall be given by the State. In the event that either average is greater than its respective objective, in either well, these remedial measures shall be restarted, and the model which formed the basis for granting temporary cessation of remedial activities shall be corrected. Permanent cessation of the Old Tailings Pond Area flushing and SCS hydrologic barrier operations shall occur when either the ground water quality objectives of Section 14.1.3 are permanently achieved pursuant to the requirements of Paragraph 4.a. of Section 8.2 and Paragraph 3.a. of Section 9.2 respectively, or with respect to the operation of the Old Tailings Ponds Area flushing the reasonable technological limits are met as described in Paragraph 4.b. of Section 8.2 and with respect to the operation of the SCS hydrologic barrier the requirements of Paragraph 3.b. of Section 9.2 are satisfied.

14.1.5 40 C.F.R. 192, Subpart D Compliance

The RAP described in this document is designed to achieve applicable ground water protection requirements of 40 C.F.R. 192, Subpart D, as it incorporates and modifies specific sections of 40 C.F.R. 264, Subpart F.

Notwithstanding any other provision of this RAP, Cotter shall comply with 40 C.F.R. Part 192, Subpart D, as it incorporates

and modifies specific sections of 40 C.F.R. Part 264, Subpart F, as described in this Section 14 and comply with Section 121, including, but not limited to, Section 121(d)(2)(B)(ii) of CERCLA.

At the Cotter site, these requirements are described below:

1. The ground water protection standard is as set forth in 40 C.F.R. 192.32 (a)(2) as it incorporates and modifies 40 C.F.R. 264.92.

2. The list of hazardous constituents is established in 40 C.F.R. 192.32 (a)(2)(i) which incorporates and modifies 40 C.F.R. 264.93. 40 C.F.R. 192.32 (a)(2)(i) adds uranium and molybdenum to the list of hazardous constituents identified in Appendix VIII of 40 C.F.R. Part 261.

3. The concentration limits are provided in 40 C.F.R. 192.32 (a)(2)(ii) as it incorporates and modifies 40 C.F.R. 264.94. Table A of 40 C.F.R. 192, Subpart D, adds concentration limits for combined radium-226 and -228 (5 pCi/l) and gross alpha-particle activity (excluding radon and uranium) (15 pCi/l) to the concentration limits established in 40 C.F.R. 264.94, Table 1. The concentration of a hazardous constituent:

- a. Must not exceed the background level of that constituent in the ground water at the time that limit is specified; or

- b. For any of the constituents listed in Table 1 of 40 C.F.R. 264.94 must not exceed the respective value given in that Table if the background level of the constituent is below the value given in Table 1; or
- c. Must not exceed an alternate limit established by the State under item 7 below.

4. The point of compliance is as set forth in 40 C.F.R. 264.95. Specifically, at the Cotter site the compliance points shall be monitoring wells located in the uppermost aquifer which is contained in the Quaternary Terrace Deposits and the Poison Canyon Formation. The compliance point wells shall be located along a vertical surface hydraulically downgradient of the main impoundment near the toe of the impoundment and along the downgradient boundary of the Old Tailings Ponds Area. The wells shall be located in the area shown on Figure 14-1. The distribution of these wells shall be proposed by Cotter. Their open interval shall not exceed 30 feet in length and the vertical distribution of monitored zones shall extend from the water table to the unweathered surface of the Poison Canyon formation. These wells shall be of a design, construction, and specific location approved by the State.

5. The compliance period is the period of time during which the compliance standard applies. The compliance period is as set forth in 40 C.F.R. 264.96.

6. The ground water compliance monitoring program is described in 40 C.F.R. 264.99 and 40 C.F.R. 264.100 (d).

7. The process for setting alternative concentration limits to be applied at compliance points is as set forth in 40 C.F.R. 192.32(a)(2)(v) which incorporates 40 C.F.R. 264.94(b) and (c), and as set forth in Section 121 of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA).

a. In establishing ACL's the following factors will be considered:

- i. Potential adverse effects on ground water quality, considering:
  - a) The physical and chemical characteristics of the waste in the regulated unit, including its potential for migration;
  - b) The hydrogeological characteristics of the facility and surrounding land;

c) The quantity of ground water and the direction of ground water flow;

d) The proximity and withdrawal rates of ground water users;

e) The current and future uses of ground water in the area;

f) The existing quality of ground water, including other sources of contamination and their cumulative impact on the ground water quality;

g) The potential for health risks caused by human exposure to waste constituents;

h) The potential damage to wildlife, crops, vegetation, and physical structures caused by exposure to waste constituents;

i) The persistence and permanence of the potential adverse effects; and

ii. Potential adverse effects on hydraulically connected surface water quality, considering:

- a) The volume and physical and chemical characteristics of the waste in the regulated unit;
- b) The hydrogeological characteristics of the facility and surrounding land;
- c) The quantity and quality of ground water and the direction of the ground water flow;
- d) The patterns of rainfall in the region;
- e) The proximity of the regulated unit to surface waters;
- f) The current and future uses of surface waters in the area and any water quality standards established for those surface waters;
- g) The existing quality of surface water, including other sources of contamination and cumulative impact on surface water quality;
- h) The potential for health risks caused by human exposure to waste constituents;

i) The potential damage to wildlife, crops, vegetation and physical structures caused by exposure to waste constituents; and

j) The persistence and permanence of the potential adverse effects.

b. An ACL shall be established through either:

i. Considering the foregoing issues (a.i.(a-i)) and (a.ii.(a-j)) and the requirements of Section 121 of CERCLA, as amended by SARA, an ACL will be set at each compliance point monitoring well, as necessary, when the Lincoln Park Monitoring Well ground water quality objectives as set forth in Section 14.1.3 have been achieved, and operation of the withdrawal well system has ceased pursuant to Paragraph 4 of Section 4.2. The ACL for each compliance point well shall be the constituent concentration in that compliance



point well as measured quarterly over a two year period; or

ii. Considering the foregoing issues (a.i.(a-i)) and a.ii.(a-j)) and the requirements of Section 121 of CERCLA, as amended by SARA, an ACL will be set at each compliance point well, as necessary, when the State approves Cotter's application demonstrating that the reasonable technological limits of the remedial activities have been reached pursuant to Paragraph 4.b. of Section 8.2, and operations of the withdrawal well system has ceased pursuant to Paragraph 4 of Section 4.2. The ACL for each compliance point well shall be the constituent concentration in that compliance point well as measured quarterly over a two year period.

8. The corrective action program required by 40 C.F.R. 192.33 as it incorporates 40 C.F.R. 264.100 for the Cotter site is as set forth in the RAP, until the completion of RAP ground water remedial activities. If an exceedance of

concentration limits occurs after RAP ground water remedial activities are completed, a corrective action program pursuant to 40 C.F.R. 192.33 shall be implemented.

14.2 Remedial Activities

The purpose of the remedial activities is to establish the Lincoln Park Monitoring Well, to establish the 40 C.F.R. 192 Compliance Point Wells, and to assess the effectiveness of the remedial ground water actions described in Sections 4 through 13.

Cotter shall perform the following remedial activities:

1. Cotter shall propose either two (2) existing wells within the southwest one-quarter (SW 1/4) of the southwest one-quarter (SW 1/4) of Section three (3) or two (2) new wells within the same area or one existing well and one new well within the same area to be the Lincoln Park Monitoring Well. The new wells shall be constructed to Class A well specifications. The monitoring wells shall be located downgradient from the DeWeese Dye Ditch in or near the Sand Creek channel, and completed between depths of the estimated water table at its highest, and 40 feet below the estimated water table at its highest, and shall be capable of being pumped at 10 gpm for one hour, prior to installation of the permanent pump.

Cotter shall implement a plan for maintenance and monitoring of the wells. If new wells are drilled to be the Lincoln Park Monitoring Well, Cotter shall collect monthly water samples from the monitoring wells. Each sample shall be analyzed for the concentrations of uranium and molybdenum. Cotter shall collect water samples monthly for analysis and maintain the well until remedial activities have been completed at the site pursuant to this RAP. Together, these wells shall be designated, and collectively referred to herein, as the "Lincoln Park Monitoring Well."

2. Cotter shall install compliance monitoring wells in the area described in Section 14.1.5, item 4 above. These wells shall be constructed to Class A well specifications (see Section 3.2.1) and the construction requirements of 40 C.F.R. 264.97(c).

Wells shall also be installed or existing wells designated which will satisfy the requirements of background monitoring set forth in 40 C.F.R. 264.97(a)(1) and (g)(2).

14.3 Requisite Assessments and Submittals

Cotter shall prepare and submit to the State for review and approval the following:

1. A proposal for existing monitoring wells and/or new monitoring wells to be the Lincoln Park Monitoring Well, which shall include:

a. The location of the wells;

- b. The well completion data of existing wells if the use of existing wells is proposed;
  - c. The design drawings and construction specifications for new wells;
  - d. QA/QC Plan;
  - e. A plan for monitoring and maintenance.
2. A written final construction report for new wells, which shall include:
- a. As-built drawings;
  - b. Explanation of and response to unexpected conditions and problems;
  - c. Summary of construction and quality assurance evaluations;
3. As a part of the RAP Annual Report specified in Section 3.1, a written annual summary of the analysis of the water samples and the annual average of the analysis of the water samples.
4. A plan for the on-site 40 C.F.R. 192 compliance point wells, which shall include:
- a. The location of the wells;
  - b. The well completion data of an existing well if an existing well is proposed;
  - c. The design drawings and construction specifications for new well(s); and

- d. The list of constituents to be measured in those wells in accordance with 40 C.F.R. 264.99.
- e. Identification of the background well(s) as required by 40 C.F.R. 264.97.

14.4 Schedule

Cotter shall design and conduct these remedial activities according to the following schedule:

1. Within sixty (60) days following the entry of a Consent Decree by the Court, Cotter shall submit a plan for the proposed Lincoln Park Monitoring Well.

2. The State shall act upon the proposal within sixty (60) days of its receipt.

3. Cotter shall start and complete construction of a new well within one hundred and eighty (180) days of the approval by the State of the proposal.

4. Cotter shall submit a final construction report to the State within one hundred twenty (120) days after the completion of new wells.

5. The State shall act upon the final construction report for new wells within one hundred twenty (120) days of its receipt.

6. As a part of the RAP Annual Report required pursuant to Section 3.1, Cotter shall submit to the State a written annual summary of the analysis of water samples and the annual average of the analysis of the water samples.

7. Cotter shall submit a proposed plan, including location, an installation schedule, and a QA/QC Plan for the compliance monitoring wells required pursuant to Paragraph 4 of Section 14.3 to the State within one hundred twenty (120) days of the completion of Old Tailings Ponds Area soil removal pursuant to Paragraph 3.a. of Section 8.2.

8. The State shall act upon the plan within sixty (60) days of its receipt.

9. Cotter shall implement the approved plan and start compliance monitoring as soon as possible pursuant to the approved schedule set forth therein and in any event within one (1) year of completion of Old Tailings Ponds Area soil removal as provided in Paragraph 8 of Section 14.4.

10. The State shall act upon the proposal within sixty (60) days of its receipt.

## 15 GROUND WATER MONITORING

### 15.1 Remedial Activities

The purpose of monitoring is to provide information (1) on which to base decisions regarding changes to remedial activities, (2) with which to verify if performance criteria are being met, (3) with which to measure the effectiveness of remediation, (4) with which to determine if regulatory requirements are being met, and (5) to meet regulatory requirements pertaining to monitoring; specifically to satisfy the ground water monitoring requirements of Section 14.

Three classes of wells are required. Class A wells shall be constructed in a manner to comply with the specifications listed in Section 3.2.1.1. New Class B wells shall be completed as described in Section 3.2.1.2. and new piezometers shall be constructed as described in Section 3.2.1.3.

Cotter shall perform the following remedial activities:

1. Install and/or operate the monitoring wells and piezometers listed in Table 15-1. Additional monitoring wells may also be required under contingent actions, part of proposals for other remedial actions, or regulatory compliance. Proposals for their locations, construction, and

completion shall be included in the pertinent planning documents.

2. Upon approval by the State, Cotter shall construct and complete the monitoring wells and piezometers that do not currently exist as required by Table 15-1 and pertinent planning documents.

3. Cotter shall sample the wells and piezometers for the constituents listed in Table 15-1, at the intervals specified in that Table. This monitoring program shall supersede all previous ground water quality monitoring requirements specified in Cotter's radioactive materials license. Approximate locations are shown on Figure 15-1. Unless specified otherwise in this document, results of measurements and analyses shall be presented annually to the State as part of the RAP Annual Report specified in Section 3.1.



TABLE 15-1

## GROUND WATER MONITORING PROGRAM

ON-SITE MONITORING

	<u>MONTHLY</u>	<u>QUARTERLY</u>	<u>ANNUAL</u>
710		A, F	A, B, C, F
711		A, F	A, B, C, F
712		A, F	A, B, C, F
001	A, C, F (1st year)	A, C, F	A, B, C, F
002	A, C, F (1st year)	A, C, F	A, B, C, F
003	A, C, F (1st year)	A, C, F	A, B, C, F
004 a & b	A, C, F (1st year)	A, C, F	A, B, C, F
005	A, C, F (1st year)	A, C, F	A, B, C, F
701 (if flow permits)	A, C, F		A, B, C, F
703 (if flow permits)	A, C, F		A, B, C, F
333		A, F	A, B, C, F
339		A, F	A, B, C, F
334		A, F	A, B, C, F
336		A, F	A, B, C, F
338		A, F	A, B, C, F
714		A, F	A, B, C, F
715	Water Levels		
716	Water Levels		
335		A, F	A, B, C, F
312		A, F (see note)	A, B, C, F
313		A, F (see note)	A, B, C, F
Withdrawal			
Well Piezometers	Water Levels		
Sec. 9/16 piezometers	Water Levels		
SCS berm piezometers	Water Levels		
329	A, F (during flush)	A, F	A, B, C, F
330	A, F (during flush)	A, F	A, B, C, F
331	A, F (during flush)	A, F	A, B, C, F

TABLE 15-1 (CONTINUED)

GROUND WATER MONITORING PROGRAM

OFF-SITE MONITORING

	<u>MONTHLY</u>	<u>QUARTERLY</u>	<u>ANNUAL</u>
119	A,F(during flush)	4.14 A,F	A,B,C,F
137		4.14	A,B,C,F
138	A,F(during flush)	4.14,A,F	A,B,C,F
139		4.14	A,B,C,F
140		4.14	A,B,C,F
141		4.14	A,B,C,F
143		4.14	A,B,C,F
144		4.14,A,F	A,B,C,F
006	A,C,F(1st year)	A,F	A,B,C,F
007	A,C,F(1st year)	A,C,F	
008	A,C,F(1st year)	A,C,F	
010	A,C,F(1st year)	A,C,F	
011	A,C,F(1st year)	A,C,F	
114		A,F	A,B,C,F
122		A,F	A,B,C,F
129		A,F	A,B,C,F
130		A,F	A,B,C,F
Lincoln Park Monitoring Well	U,Mo		A,B,C,F

TABLE 15-1 (CONTINUED)

GROUND WATER MONITORING PROGRAM

PATHWAY MONITORING

	<u>MONTHLY</u>	<u>QUARTERLY</u>	<u>ANNUAL</u>
<u>Northwest</u>			
009	A,C,F(1st year)	A,C,F	
014	Mo, Water Levels	A,C,F	
325	U,Mo,F		A,B,C,F
337	U,Mo,F		A,B,C,F
015	Mo, Water Levels	A,C,F	
342		A,F	A,B,C,F
Piezometers	Water Levels		
<u>Northeast</u>			
016	Mo, Water Levels		
017	Mo, Water Levels		
Piezometers	Water Levels		
<u>Mine Shaft</u>			
018	Mo(for 1st year)	Mo	
324	Mo(for 1st year)	Mo	
<u>SURFACE WATER</u>			
526		U,Mo,F	

NOTES:

1. The proposal for the Old Tailings Ponds Area flushing program will include provisions for monitoring the ground water system around the perimeter of the area being flushed. This proposal shall include wells sufficient for detecting the movement of water from the area being flushed.

2. Wells 312 and 313 will be sampled quarterly for the parameters in lists A and F. This sampling shall continue throughout a period of three years following successful drilling, completion, and development of Class A wells 004 a and 004 b. Wells 004 a and 004 b will be sampled according to the schedule indicated in the above table.

3. "During flush" refers to the flush described in Section 12.2.1.

## EXPLANATION OF DESIGNATORS

<u>Designator</u>	<u>Constituents</u>
A	Mo, U
B	Al, Cd, Cu, Fe, Ni, Pb, Mn, V, Zn
C	SO <sub>4</sub> , HCO <sub>3</sub> , CO <sub>3</sub> , Cl, NO <sub>3</sub> , NH <sub>4</sub> , Na, Ca, K, Mg
F	Temp, pH, SpC, DTW, Flow (Measured in the Field); TDS, pH, SpC, Alkalinity (Measured in the Lab)
4.14	U, Ra-226, Th-230, Pb-210, Po-210

15.2 Requisite Assessments and Engineering Activities

1. Cotter shall submit to the State a detailed monitoring plan which includes an installation schedule for new wells and piezometers.

2. Cotter shall submit to the State an appropriate QA/QC Plan for this monitoring program.

3. Cotter shall submit a final construction report for any new wells or piezometers constructed pursuant to Section 15.1, including well logs.

4. Cotter shall submit, unless otherwise specified in this document, results of monitoring measurements and analyses in the RAP Annual Report.

15.3 Schedule

1. Cotter shall submit a proposed detailed monitoring plan, including installation schedule for new wells and piezometers, and a QA/QC Plan to the State within one hundred twenty (120) days of entry of the Consent Decree by the Court.

2. The State shall act on the plans within sixty (60) days of receipt.

3. Cotter shall implement the approved plans pursuant to the approved schedule.

4. Cotter shall submit the final construction within one hundred twenty (120) days of completing construction of new wells and piezometers. 6/26

5. The State shall act upon this report within one hundred twenty (120) days. 10/24

6. Cotter shall submit the monitoring results and analyses annually as part of the RAP Annual Report specified in Section 3.1.

7. The State shall act upon the Annual Report within one hundred twenty (120) days of its receipt.

## 16 MAIN IMPOUNDMENT

### 16.1 Description of Operations and Relevant Environmental Conditions

The main impoundment is a potential source of wind dispersed tailings particulates. Controlling exposure of dry tailings beaches in the main impoundment is addressed in this Section.

### 16.2 Remedial Activities

The purpose of these remedial activities is to effectively minimize and mitigate the main impoundment as a source of wind dispersed particulates.

Cotter shall perform the following remedial activities:

1. Cotter shall manage the main impoundment to:
  - a. Minimize the area of the tailings beaches;
  - b. Control the drying of the tailings beaches, as necessary, to minimize and mitigate particulate dispersion.

### 16.3 Requisite Assessments and Engineering Activities

Cotter shall prepare and submit to the State the following:

1. A written annual summary on the implementation of this remedial activity to effectively minimize and mitigate the main impoundment as a potential

source of wind dispersed particulates, which shall include, as appropriate:

- a. Summary description of results of activities; and,
- b. Explanation of unexpected conditions and responses to any problems which prevent effective minimization and mitigation of the main impoundment as a potential source of wind dispersed particulates.

16.4 Schedule

Cotter shall conduct these remedial activities according to the following schedule:

1. Cotter shall implement this remedial activity thirty (30) days after the entry of the Consent Decree by the Court.
2. Cotter shall submit, as part of the RAP Annual Report specified in Section 3.1., a written annual summary as described in Section 16.3.
3. The State shall act upon the Annual Report within one hundred twenty (120) days of its receipt.



## 17 OLD TAILINGS PONDS AREA

### 17.1 Description of Operations and Relevant Environmental Conditions

The Old Tailings Ponds Area is a potential source of wind dispersed particulates. Controlling particulate emissions from the Old Tailings Ponds Area is addressed in this Section.

### 17.2 Remedial Activities

The purpose of these remedial activities is to effectively minimize and mitigate the Old Tailings Ponds Area as a potential source of wind dispersed particulates.

Cotter shall perform the following remedial activities.

1. Cotter shall revegetate or cover, as appropriate, the Old Tailings Ponds Area to effectively minimize and mitigate particulate dispersion.

2. In those areas where the operation of the production injection and extraction ground water flushing program (see Section 8) prevents revegetation or in those areas where the revegetation program is not successful, Cotter shall, as appropriate, apply either a surface cover, such as gravel, surfactant, tactifier or mulch, or wet the area to effectively minimize and mitigate particulate dispersion.

### 17.3 Requisite Assessments and Engineering Activities

Cotter shall prepare and submit to the State for review and approval the following:

1. A plan to revegetate or cover the Old Tailings Ponds Area, which shall include:

For areas to be revegetated:

- a. Area to be revegetated;
- b. Species to be planted;
- c. Seeding and/or stocking rates;
- d. Seed bed preparation;
- e. Methods of planting;
- f. Mulching and fertilizing specifications;
- g. A monitoring and maintenance plan for the vegetation;
- h. Proposed revegetation success standards, including criteria to be measured, such as percent of cover and rate of production, measurement methods, and seasonal effectiveness;
- i. Schedule.

For areas subject to alternate surface cover or wetting:

- a. Description and purpose of activities;
- b. Schedule;
- c. Operations, inspection and maintenance plan;
- d. Discussion of reasons for use of alternate surface cover or wetting instead of revegetation;

2. A written report on the completion of the plan required by Paragraph 1 of this Section, which shall include:

- a. Description of activities;
- b. Explanation of and response to unexpected conditions and problems;
- c. Discussion of actual performance and a comparison to the success standards.

3. A plan to recontour and to establish a self-regenerating vegetation cover in the Old Tailings Ponds Area at mill closure and site reclamation pursuant to the approved final reclamation plan (which is not part of this RAP), which shall include:

- a. Description and purpose of activities;
- b. QA/QC Plan for contouring operation;
- c. Species to be planted;
- d. Methods of planting;
- e. Schedule;
- f. Proposed revegetation success standards, including criteria to be measured, such as percent of cover and rate of production and measurement methods.

4. A written annual activities summary regarding the plan required by Paragraph 1 of this Section, which shall include:

- a. Description and results of activities;
- b. Explanation of and response to unexpected conditions and problems;
- c. Proposed modifications to the plan to effectively minimize and mitigate the Old Tailings Ponds Area as a potential source of wind dispersed particulates.

5. A written final report on the implementation and completion of the plan required by Paragraph 3 of this Section, which shall include:

- a. Description of activities and results;
- b. Explanation of and response to unexpected conditions and problems;
- c. Quality assurance and quality control evaluation.

17.4 Schedule

Cotter shall conduct these remedial activities according to the following schedule:

1. Within ninety (90) days of the entry of a Consent Decree by the Court, Cotter shall submit a plan pursuant to Paragraph 1 of Section 17.3.

2. The State shall act upon the plan within ninety (90) days of receipt.

3. Cotter shall implement the approved plan required by Paragraph 1 of Section 17.3 pursuant to the

approved schedule, but in any case no later than one (1) year after State approval.

4. Cotter shall submit the written completion report as required as Paragraph 2 of Section 17.3 within one hundred twenty (120) days of completion of the plan.

5. The State shall act upon the written completion report within sixty (60) days of its receipt.

6. Cotter shall submit, as part of the RAP Annual Report specified in Section 3.1, a written annual activities summary.

7. The State shall act upon the annual report within one hundred twenty (120) days of its receipt.

8. As an element of site closure, Cotter shall submit a plan pursuant to Paragraph 3 of Section 17.3.

9. The State shall act upon the plan within ninety (90) days of receipt.

10. Cotter shall implement the approved plan for final recontouring and revegetating the Old Tailings Ponds Area pursuant to the approved schedule.

11. Cotter shall submit a written final report pursuant to Paragraph 5 of Section 17.3 within one hundred twenty (120) days of completion of final contouring and establishment of self-regenerating vegetation of the Old Tailings Ponds Area.

12. The State shall act upon the written final report within one hundred twenty (120) days after its receipt.

## 18 ORE HANDLING AND ORE STOCKPILES

### 18.1 Description of Operations and Relevant Environmental Conditions

The uranium ore at the site is presently stockpiled and handled in two areas. One, the ore handling area, is immediately north of the mill and is used to feed the ore hopper of the mill. The other is approximately 800 to 1000 feet northeast of the mill and is used to inventory or stockpile ore received from the mines, prior to the ore's transport to the ore handling area. These stockpiles and handling areas are potential sources of wind dispersed particulates. Ore stockpiles are also a potential source of ground and surface water impacts.

### 18.2 Remedial Activities

The purpose of these remedial activities is to effectively minimize and mitigate the uranium ore stockpiles and handling areas as potential sources of wind dispersed particulates and potential ground water and surface water impacts.

Cotter shall perform the following remedial activities:

1. Cotter shall construct and maintain compacted clay ore pads with runoff water control in accordance with the proposed design of the compacted clay pads, as previously submitted by Cotter to the Colorado Department of Health as part of its "Engineering Report and Design Specifications for

Water and Waste Management Plan - Part 1 at Canon City Mill, Fremont County, Colorado," dated June 29, 1984, Volumes I and II. Ore stockpiles shall be maintained and ore handling shall take place only in those areas where these ore pads are constructed and maintained.

2. The ore stockpiles shall be subject to surface wetting, as necessary, to effectively minimize and mitigate them as a potential source of wind dispersed particulates. The use of water for dust control will not contaminate soils, ground water or surface water.

3. Ore handling areas shall not be used to stockpile ore unless the stockpiles in the ore handling areas are subject to wetting to effectively minimize and mitigate them as a potential source of wind dispersed particulates.

4. The volume, area, and moisture content of the ore in the ore handling process shall be managed to effectively minimize and mitigate it as a potential source of wind dispersed particulates.

18.3 Requisite Assessments and Engineering Activities

Cotter shall prepare and submit to the State for review and approval the following:

1. A written final construction report, which shall include:
  - a. Description of activities and results;

- b. Explanation of and response to unexpected conditions and problems;
- c. Quality assurance and quality control evaluation;
- d. Plan for management of these stockpiles to minimize dust generation.

2. A written annual summary on the implementation of the plan to effectively minimize and mitigate the ore stockpiles and ore handling areas as potential sources of wind dispersed particulates and potential ground and surface water impacts, which shall include:

- a. Description and results of activities, if any;
- b. Explanation of and response to unexpected conditions and problems;
- c. Proposed modifications to the plan to effectively minimize and mitigate the uranium ore stockpiles and ore handling areas as a potential source of wind dispersed particulates and ground and surface water impacts.

18.4 Schedule

Cotter shall conduct these remedial activities according to the following schedule:



1. Cotter shall complete the construction of the compacted clay pads and conduct all ore handling activities on the clay pads within one (1) year after entry of a Consent Decree by the Court.

2. Cotter shall submit a written final construction report within one hundred twenty (120) days after completion of construction of the clay pads.

3. The State shall act upon the written final construction report within one hundred twenty (120) days after its receipt.

4. Cotter shall implement the remedial activities required by Paragraphs 2, 3 and 4 of Section 18.2 within thirty (30) day of receipt of the State's approval of the final construction report.

5. Cotter shall submit, as part of the RAP Annual Report specified in Section 3.1, a written annual summary as described in Paragraph 2 of Section 18.3.

6. The State shall act upon the Annual Report within one hundred twenty (120) days of its receipt.

## 19 CATALYST FILE

### 19.1 Description of Operations and Relevant Environmental Conditions

The catalyst pile is comprised of approximately 500 tons of material.

### 19.2 Remedial Activities

The purpose of these remedial activities is to dispose of the catalyst material at a permitted or interim status hazardous waste facility.

Cotter shall perform the following remedial activities:

1. Cotter shall remove and dispose of the catalyst material at a permitted or interim status hazardous waste facility. Cotter shall document such removal in accordance with applicable law.
2. Cotter shall remove the hypalon liner and dispose of it at a permitted or interim status hazardous waste facility or demonstrate that the hypalon liner is not a characteristic hazardous waste.
3. Cotter shall verify catalyst removal by soil sampling. Five soil samples collected from the area beneath the Hypalon liner to a depth of three (3) inches shall be composited into one sample. The sample location shall be randomly selected using a grid pattern comprised of ten (10) squares. At least one sample shall be collected from an area overlain by catalyst. The composite sample shall be subjected

to the E.P. toxicity test procedure, as set forth in 40 C.F.R. 261.24, and analyzed only for cadmium. If this laboratory test result exceeds 1.0 mg/l of cadmium, Cotter shall conduct further sampling of this area pursuant to "Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods" (Publication No. SW-846), as codified in 40 C.F.R. 260.11, dated July 1, 1986. The samples collected and analyzed pursuant to the foregoing procedure shall be subjected to the EP Toxicity test procedure and analyzed only for cadmium, and these results shall be used to determine the volume of soil underlying the Hypalon liner requiring off-site disposal, if any.

19.3 Requisite Assessments and Engineering Activities

Cotter shall prepare and submit to the State for review and approval the following:

1. A plan for removal and disposal of the catalyst material which shall include:
  - a. Description of activities;
  - b. Method of removal and disposal of the material;
  - c. Schedule.
2. A written final report on the removal and disposal of the catalyst material and the results of testing conducted pursuant to Paragraph 3 of Section 19.2, which shall include:

- a. Description of activities and results;
- b. Quantity of material removed and the location of disposal;
- c. Explanation of and response to unexpected conditions and problems;
- d. Test results, including quality assurance and quality control evaluations.

19.4 Schedule

Cotter shall conduct these remedial activities according to the following schedule;

1. Cotter shall submit a proposed plan for the removal and disposal of the catalyst to the State within sixty (60) days of entry by the Court of the Consent Decree.

2. The State shall act upon the proposed plan within sixty (60) days of its receipt.

3. Cotter shall implement the disposal plan in accordance with the approved schedule.

4. Cotter shall submit a written final report within thirty (30) days of completion of removal and disposal of the catalyst material and completion of the test described in Paragraph 3 of Section 19.2.

5. The State shall act upon the final removal report within sixty (60) days of its receipt.

## 20 YELLOWCAKE DRYER

### 20.1 Description of Operations and Relevant Environmental Conditions

The yellowcake dryer stack is a potential source of wind dispersed particulates.

### 20.2 Remedial Activities

The purpose of these remedial activities is to effectively minimize and mitigate the yellowcake dryer stack as a potential source of wind dispersed particulates.

Cotter shall perform the following remedial activities:

1. Cotter shall submit either a report to substantiate that current emission control technology is best available technology or a proposal for application of best available technology at the yellowcake dryer stack.

2. The yellowcake dryer shall be operated in accord with Colorado Radioactive Materials License 369-01S and the Colorado Rules and Regulations Pertaining to Radiation Control.

### 20.3 Requisite Assessments and Engineering Activities

Cotter shall prepare and submit to the State for review and approval the following:

1. A report to substantiate that the technology presently used on the yellowcake dryer is the best available, which shall include:

- a. Description of available technology and its effectiveness;
- b. Description of technology presently used and its effectiveness;
- c. Discussion of methods to maximize effectiveness of technology presently in use.

2. As determined by the State, if the best available technology is not in use, a plan to install, operate and maintain the best available technology, which shall include;

- a. Description of available technology and its effectiveness;
- b. Description of technology to be used and its effectiveness;
- c. QA/QC Plan;
- d. Schedule;
- e. Operations and maintenance plan.

3. A written final construction report if new technology is installed, which shall include:

- a. ~~Accurate as built drawings;~~
- b. Explanation of and response to unexpected conditions and problems;
- c. Quality assurance and quality control evaluations;

- d. Operations and maintenance plan.
- 4. A written annual summary, which shall include:
  - a. Description and results of activities;
  - b. Explanation of and response to unexpected conditions and problems;
  - c. Comparison of actual performance of the yellowcake dryer to the best available technology;
  - d. Quality assurance and quality control evaluations;
  - e. Proposed modifications to the plan to effectively minimize and mitigate the yellowcake dryer as a potential source of wind dispersed particulates.

#### 20.4 Schedule

Cotter shall conduct these remedial activities according to the following schedule:

1. Cotter shall submit the report, required by Paragraph 1 of Section 20.3, within sixty (60) days after the entry of a Consent Decree by the Court.
2. The State shall act upon the report required by Paragraph 1 of Section 20.3, within sixty (60) days of its receipt.

3. Cotter shall submit the plan required by Paragraph 2 of Section 20.3 within sixty (60) days of the entry of the Consent Decree by the Court, if a report pursuant to Paragraph 1 of Section 20.3 is not submitted, or within sixty (60) days of the State's determination that the best available technology is not in use, if a report pursuant to Paragraph 1 of Section 20.3 is submitted.

4. The State shall act upon the plan within sixty (60) days of its receipt.

5. Cotter shall implement the plan required by Paragraph 2 of Section 20.3 pursuant to the approved schedule.

6. Cotter shall submit a written final construction report within one hundred twenty (120) days of completion of installation of best available technology, if required pursuant to Paragraph 2 of Section 20.3.

7. The State shall act upon the written final construction report within one hundred twenty (120) days after receipt.

8. Cotter shall submit, as part of the RAP Annual Report specified in Section 3.1, a written annual summary as described in Section 20.3.

9. The State shall act upon the Annual Report within one hundred twenty (120) days after receipt.



## 21 ON-SITE SOILS

### 21.1 Description of Operations and Relevant Environmental Conditions

Particulates are dispersed from the sources identified in Sections 16, 17, 18 and 20 to soils both on and off the site. The on-site soils then serve as a potential secondary source of wind dispersed particulates.

### 21.2 Remedial Activities

The purpose of these remedial activities is to effectively minimize and mitigate the soils on the mill site as a potential secondary source of wind dispersed particulates and to provide for soil cleanup at mill closure.

Cotter shall perform the following remedial activities:

1. Cotter shall revegetate all on-site soils, with the exception of soils in areas where revegetation is prevented by mill operations or by remedial activities conducted in accord with this Remedial Action Plan or where existing vegetation provides adequate cover as determined by the standards developed in the revegetation plan required in this Section, to effectively minimize and mitigate wind dispersion.
2. In areas where revegetation is prevented by mill operations, with the exception of roads (see Section 22), and in areas where revegetation is prevented by remedial activities conducted in accord with this Remedial Action Plan,

Cotter shall apply either a surface cover, such as gravel, surfactants, tactifiers, or mulch, or wet the area to effectively minimize and mitigate wind dispersion.

3. As an element of mill closure and site reclamation, Cotter shall:

- a. Conduct a calibrated gamma scintillometer survey on a one hundred (100) square meter grid in accord with calibration and measurement procedures consistent with the procedures of the Colorado Department of Health;
- b. Conduct a soil sample survey to confirm the findings of the scintillometer survey in accord with a sampling protocol utilizing the unbalanced hierarchical analysis of variance techniques, as specified in Sampling Designs for Geochemical Baseline Studies in the Colorado Oil Shale Region: A Manual for Practical Application, U.S. Department of Energy, June 1980 (D.O.E./EV/10298-2) or other analysis approved by the State. All soil samples shall be analyzed for radium-226, and molybdenum, except for samples collected

from the Old Tailings Ponds Area, which shall be analyzed only for radium-226.

c. Based on the gamma scintillometer survey and the soil sample survey, Cotter shall remove all soil containing concentrations of radium-226, averaged over areas of 100 square meters, which is greater than the background mean by more than:

- i. five (5) picoCuries per gram (pCi/g) averaged over the first fifteen (15) centimeters (cm) below the surface, or
- ii. fifteen (15) picoCuries per gram (pCi/g) averaged over fifteen (15) centimeter (cm) thick layers more than fifteen (15) centimeters (cm) below the surface.

d. Based on the soil sample survey, Cotter shall remove all soil containing concentrations of molybdenum, averaged over areas of 100 square meters, which is greater than the background range by more than fifteen (15) milligrams per kilogram (mg/kg) averaged over the first

fifteen (15) centimeters (cm) below the surface. In the Old Tailings Ponds Area, soil removal shall not be required based upon the molybdenum concentrations.

- e. Dispose of all removed soil in the main or secondary impoundments and establish self regenerating vegetation cover in all areas where soil removal has eliminated the vegetation cover or reduced the vegetation cover to below the standards developed in the revegetation plan required in Paragraph 1 of Section 21.3.

21.3 Requisite Assessments and Engineering Activities

Cotter shall prepare and submit to the State for review and approval the following:

1. A plan to revegetate or cover the on-site soils, which shall include:

For areas to be revegetated:

- a. Species to be planted;
- b. Seeding and/or stocking rates;
- c. Seed bed preparation;
- d. Methods of planting;
- e. Mulching and fertilizing specifications;

- f. A maintenance plan for the revegetation;
- g. Proposed revegetation success standards, including criteria to be measured, such as percent of cover and rate of production, measurement methods, and seasonal effectiveness;
- h. Schedule.

For areas subject to alternate surface cover

or wetting:

- a. Description and purpose of activities;
- b. Schedule;
- c. Operations, inspection and maintenance plan;
- d. Discussion of reasons for use of alternate surface cover or wetting instead of revegetation.

2. A written report on the completion of the plan required by Paragraph 1 of this Section, which shall include:

- a. Description of activities;
- b. Explanation of and response to unexpected conditions and problems;
- c. Discussion of actual performance and a comparison to the success standards.

3. A plan to conduct the gamma scintillometer survey and soil sample survey and to remove and dispose of the soil and to establish self-regenerating vegetation cover, as required by Paragraph 3 of Section 21.2, which shall include:

a. For gamma scintillometer and soil sample survey:

- i. Description of methods and procedures for gamma scintillometer survey;
- ii. Description of methods and procedures for soil sample survey;
- iii. Description of methods and procedures to remove and dispose of the soil;
- iv. QA/QC plan.

b. For establishment of self-regenerating vegetation cover:

- i. Description and purposes of activities;
- ii. QA/QC Plan for contouring operations, if necessary;
- iii. Species to be planted;
- iv. Seed bed preparation;
- v. Methods of planting;

vi. Proposed self-regenerating vegetation success standards, including criteria to be measured, such as percent of cover and rate of production, and measurement methods;

vii. Schedule.

4. A written annual activities summary regarding the plan required by Paragraph 1 of this Section, which shall include:

- a. Description and results of activities;
- b. Explanation of and response to unexpected conditions and problems;
- c. Proposed modifications to the plan to effectively minimize and mitigate the on-site soils as a potential secondary source of wind dispersed particulates.

5. A written final report on the gamma scintillometer survey, soil sample survey, and implementation of the plan for soil removal and disposal and establishment of self-regenerating vegetation cover as required by Paragraph 3 of Section 21.2, which shall include:

- a. Description of activities;
- b. Explanation of and response to unexpected conditions and problems;

- c. Topographic map with approximate grid locations;
- d. Values and ranges of meter readings;
- e. Quantity of soil removed;
- f. Quality assurance and quality control evaluations.

#### 21.4 Schedule

Cotter shall conduct these remedial activities according to the following schedule:

1. Within ninety (90) days of the entry of a Consent Decree by the Court, Cotter shall submit a plan pursuant to Paragraph 1 in Section 21.3.
2. The State shall act upon the plan within ninety (90) days of receipt.
3. Cotter shall implement the approved plan required by Paragraph 1 of Section 21.3 pursuant to the approved schedule, but in any case, no later than one (1) year after State approval.
4. Cotter shall submit a written completion report as required by Paragraph 2 of Section 21.3 within one hundred twenty (120) days of completion of the plan.
5. Cotter shall submit, as part of the RAP Annual Report specified in Section 3.1, a written annual activities summary as described in Section 21.3.



6. The State shall act upon the annual report within one hundred and twenty (120) days of its receipt.

7. As an element of mill closure and site reclamation, Cotter shall submit a plan for the gamma scintillometer survey, soil sample survey, soil removal and disposal and self-regenerating vegetation plan, as required by Paragraph 3 of Section 21.3.

8. The State shall act upon the surveys, removal plan, and self-regenerating vegetation plan within one hundred and eighty (180) days of its receipt.

9. Cotter shall implement the surveys, removal plan, and revegetation plan pursuant to the approved schedule.

10. Cotter shall submit a written final report within sixty (60) days of completion of the gamma scintillometer survey, soil sample survey, implementation of soil removal and disposal, and establishment of self-regenerating vegetation cover.

11. The State shall act upon the written final report within one hundred and eighty (180) days after its receipt.

## 22 ROADS

### 22.1 Description of Operations and Relevant Environmental Conditions

The roads on-site are a potential source of windblown particulates.

### 22.2 Remedial Activities

The purpose of these remedial activities is to effectively minimize and mitigate the roads as a potential source of windblown particulates.

Cotter shall water the roads with uncontaminated water on the mill site as necessary to effectively minimize and mitigate air dispersion.

### 22.3 Requisite Assessments and Engineering Activities

Cotter shall prepare and submit to the State for review and approval the following:

1. A plan for watering the roads on the mill site, which shall include:
  - a. Description and purpose of activities;
  - b. Schedule.
2. A written annual activities summary on the watering of the roads to effectively minimize and mitigate air dispersion, which shall include:
  - a. Description and results of activities;
  - b. Explanation of and response to unexpected conditions and problems;

- c. Proposed modifications to the plan to continue to effectively minimize and mitigate the roads as a potential source of wind dispersed particulates.

22.4 Schedule

1. Cotter shall submit a plan for watering the roads on-site within thirty (30) days of approval of the entry of a Consent Decree by the Court.

2. The State shall act upon the plan within thirty (30) days of receipt.

3. Cotter shall implement the plan for watering the roads on-site pursuant to the approved schedule.

4. Cotter shall submit, as part of the RAP Annual Report specified in Section 3.1, a written annual summary as described in Paragraph 2 of Section 22.3.

5. The State shall act upon the Annual Report within one hundred and twenty (120) days of its receipt.

## 23 AIR MONITORING

### 23.1 Description of Operations and Relevant Environmental Conditions

A number of potential sources of wind dispersed particulates exist on the site. These potential sources include the main and secondary impoundments, the Old Tailings Ponds Area, the ore stockpile and ore handling area, and the yellowcake dryer. Remedial actions to mitigate these areas as potential sources of particulates are addressed in Sections 16, 17, 18, 20, 21 and 22.

### 23.2 Remedial Activities

The purpose of these remedial activities is to monitor the wind dispersion of particulates, to evaluate the amount of particulates leaving the mill site by the medium of air, and to evaluate the effectiveness of other remedial activities.

Cotter shall perform the following remedial activities:

1. Continue to operate and maintain seven (7) existing continuous air samplers at the locations shown on the Figure 23-1.
2. Install, operate, and maintain two (2) additional event-actuated air samplers at the locations shown on Figure 23-1.
  - a. The east boundary event actuated air sampler shall operate only when the wind

direction is from between two hundred and twenty-five (225) degrees (southwest) and three hundred and fifteen (315) degrees (northwest) and the wind speed is four (4) miles per hour or greater.

- b. The west boundary event actuated air sampler shall operate only when the wind direction is from between ninety (90) degrees (east) and one hundred and eighty (180) degrees (south) and the wind speed is four (4) miles per hour or greater.
- c. The two event actuated air samplers shall be equipped with recording devices which will allow determination of operating time and volume of air sampled.

3. The event actuated air sampler filters shall be analyzed for:

- a. Uranium;
- b. Thorium-230;
- c. Radium-226;
- d. Total suspended particulates using pre- and post-sampling filter weights.

4. The continuous air sampler filters shall be analyzed in accordance with U.S. Nuclear Regulatory Commission Regulatory Guide 4.14.

5. After three years of data collection, Cotter shall submit a report evaluating the capability and usefulness of the event-actuated air samplers to achieve the purposes set forth in Section 23.2. Equipment adequacy shall be judged on the basis of data capture efficiency and suitability of air quality data collected. Cotter shall propose modification of the event-actuated sampling program, if necessary. Cotter shall implement the State approved modification.

23.3 Requisite Assessments and Engineering Activities

Cotter shall prepare and submit to the State for review and approval the following:

1. A monitoring plan, which shall include:
  - a. Description of existing air samplers;
  - b. Design of and installation procedures for event-actuated air samplers;
  - c. Schedule;
  - d. Operations and maintenance plan;
  - e. Monitoring schedule;
  - f. QA/QC Plan.
2. A written report on the installation of the event-actuated air samplers, which shall include:
  - a. Description and results of activities;

- b. Explanation of and response to unexpected conditions and problems;
- c. Quality assurance and quality control evaluations.

3. A written quarterly report on the results of the monitoring program, which shall include:

- a. Description and results of activities;
- b. Explanation of and response to unexpected conditions and problems;
- c. Quality assurance and quality control evaluations;
- d. Monitoring results.

4. A report pursuant to Paragraph 5,

Section 23.2.

23.4 Schedule

Cotter shall conduct these remedial activities according to the following schedule:

1. Cotter shall submit a proposed monitoring plan to the State within one hundred twenty (120) days of entry by the Court of the Consent Decree.

2. The State shall act upon the plan within sixty (60) days of receipt.

3. Cotter shall implement the approved plan pursuant to the approved schedule.

4. Cotter shall submit an installation report to the State within one hundred twenty (120) days of the completion of installation activities.

5. The State shall act on the installation report within one hundred twenty (120) days of receipt.

6. Cotter shall submit quarterly reports to the State within ninety (90) days from the end of each quarter.

7. The State shall act upon the reports within ninety (90) days or as appropriate.

8. Cotter shall submit the report required by Paragraph 5 of Section 23.2 ninety (90) days after the collection of three years of event-actuated air quality data.

9. The State shall act upon this report within sixty (60) days of its receipt.

10. Cotter shall implement any modifications to the event-actuated monitoring program within one hundred eighty (180) days of State approval.



## 24 SITE ADJACENT SOIL

### 24.1 Description of Operations and Relevant Environmental Conditions

Particulates are dispersed from the sources identified in the RAP to soils off the site. Off-site land use is described in Section 2.2.

### 24.2 Remedial Activities

The purpose of these remedial activities is to effectively minimize and mitigate the off-site soils as a potential secondary source of wind dispersed particulates and of surface water sediment transport, to restrict access to impacted soils, if any, and to reduce constituent concentrations in soils to background range.

Cotter shall perform the following remedial activities.

1. Cotter shall submit a report. The purposes of this report are to determine the adequacy of all existing radium-226 soils data for use in determination of the location of grazing restriction fences and to document the grazing uses of adjacent lands. The State shall review this report for its adequacy to address soil data needs.

2. Cotter shall, if required by the State, conduct a supplemental soils survey of the soils adjacent to the mill site. The site adjacent soil survey area is defined as beginning at the restricted area boundary and continuing outward from that boundary until concentrations of radium-226

are below five (5) picoCuries per gram (pCi/g) above background range averaged over the upper fifteen (15) centimeters of soil. If the existing soil data do not result in joint approval of the five (5) picoCurie per gram (pCi/g) above background range boundary(ies), then Cotter shall conduct this supplemental survey. The supplemental survey shall include:

- a. A calibrated gamma scintillometer survey in accord with calibration and measurement procedures consistent with procedures of the Colorado Department of Health;
- b. Soil sampling, if necessary;
- c. All soil samples shall be analyzed for radium-226.

3. Based on existing soil data presented in the report on all existing soil data or on the results of the supplemental site adjacent soil survey (see Paragraph 2 of this Section), Cotter shall, except where established that grazing does not occur, erect and maintain fences to prevent grazing in all areas where the concentration of radium-226 is greater than the background range by more than five (5) picoCuries per gram (pCi/g) averaged over the first fifteen (15) centimeters (cm) below the surface.

4. As a part of mill closure and site reclamation, Cotter shall:

- a. Conduct a site closure soil survey of off site soils in areas contiguous to the site, which were not surveyed in conjunction with the pathway management program (see Section 29). The survey shall include a soil calibrated gamma scintillometer survey on a one hundred (100) square meter grid in accord with the calibration and measurement procedures consistent with the procedures established by the Colorado Department of Health.
- b. Conduct a site closure soil sample survey to confirm the results of the survey required in Paragraph 4.a. of this Section in accord with a sampling protocol utilizing the unbalanced hierarchical analysis of variance techniques, as specified in Sampling Designs for Geochemical Baseline Studies in the Colorado Oil Shale Region: A Manual for Practical Application, U.S. Department of Energy, June 1980

(D.O.E./EV/10298-2), or other analysis approved by the State. All soil samples shall be analyzed for radium-226 and molybdenum.

- c. Based on the gamma scintillometer survey, as required in Paragraph 4.a. of this Section, and the soil sample survey, as required in Paragraph 4.b. of this Section, Cotter shall remove all soil with concentrations of radium-226 greater than the background range in the soil averaged over the first fifteen (15) centimeters (cm) below the surface. All removed soils shall be disposed in the main and/or secondary impoundments. Cotter may propose an alternative remedial method(s) to soil removal that is as effective as soil removal.
- d. Based on the soil sample survey, as required in Paragraph 4.b. of this Section, Cotter shall remove all soil with concentrations of molybdenum greater than the background range in the soil averaged over the first fifteen (15) centimeters (cm) below the surface.

All removed soils shall be disposed in the main or secondary impoundments.

Cotter may propose an alternative remedial method(s) to soil removal that is as effective as soil removal.

- e. Cotter shall perform a final soil survey in all areas where soil has been removed to confirm that radium-226 and molybdenum levels have been reduced to background range. The final soil survey shall be conducted by calibrated gamma scintillometer survey. Confirming soil samples shall be collected and analyzed for molybdenum and radium-226 from those areas where gamma scintillometer readings exceed background range. The criteria described in Paragraphs 4.c. and d. shall be met.
- f. Cotter shall develop a soil restoration program, as necessary, to promote regrowth of vegetation in disturbed areas and to minimize increases in erosion rates.

24.3 Requisite Assessments and Engineering Activities

Cotter shall prepare and submit to the State for review and approval the following:

1. Cotter shall submit a report of all existing radium-226 soil data, which shall include:
  - a. All existing radium-226 soil data;
  - b. Methods of locating sample sites;
  - c. Methods of sample collection;
  - d. Methods of sample preparation;
  - e. Methods of analysis;
  - f. Criteria for rejection of a sample;
  - g. Information pertaining to the grazing uses of adjacent lands;
  - h. Evaluation of need for supplemental site adjacent soil survey.

2. A plan for a supplemental site adjacent soil survey, if required, (see Paragraph 2 of Section 24.2) which shall include:

- a. Description of methods and procedures for gamma scintillometer survey, including calibration procedures;
- b. Description of methods and procedures for soil sample survey, if necessary;
- c. QA/QC Plan;
- d. Schedule.

3. A written report on the supplemental soil survey, which shall include:

- a. Summary of methods, procedures and survey locations;
- b. Analyses and survey results;
- c. Topographic map with approximate grid locations and sample locations with results at each location;
- d. Values and ranges of meter readings;
- e. Explanation of and response to unexpected conditions;
- f. Quality assurance and quality control evaluations.

4. Pursuant to Paragraph 3 in Section 24.2, a plan to erect fences to prevent grazing, which shall include:

- a. Design drawings and construction specifications;
- b. Location of the fences;
- c. QA/QC Plan;
- d. Maintenance plan;
- e. Schedule.

5. A written final construction report on the erection of the fences to prevent grazing, which shall include:

- a. Accurate as-built drawings;
- b. Explanation of and response to unexpected conditions and problems;

- c. Quality assurance and quality control evaluations.

6. A written annual activities summary on the maintenance of the fences to prevent grazing, which shall include:

- a. Description of activities;
- b. Explanation of and response to unexpected conditions and problems;
- c. Documentation of grazing status on adjacent lands.

7. A plan to conduct the site closure gamma scintillometer survey (see Paragraph 4.a. of Section 24.2), the site closure soil sample survey (see Paragraph 4.b of Section 24.2), to remove and dispose of the soils (see Paragraphs 4.c. and 4.d. of Section 24.2), to conduct the final soil survey (see Paragraph 4.e. of Section 24.2) and, as necessary, to conduct a soil restoration program (see Paragraph 4.f. of Section 24.2) which shall include:

- a. Description of methods and procedures for site closure gamma scintillometer survey;
- b. Description of methods and procedures for site closure soil sample survey;
- c. Description of methods and procedures for the final soil survey;



- d. Description of methods and procedures to remove and dispose of the soil, and, a plan to restore soils;
- e. QA/QC Plan;
- f. Schedule;
- g. All existing molybdenum and radium-226 soil data in the area.

8. A written final implementation report on the plan required in Paragraph 4 of Section 24.2, which shall include:

- a. Summary of methods and procedures and survey locations;
- b. Data collected;
- c. Topographic map with approximate grid locations and sample locations with results at each location;
- d. Values and ranges of meter readings;
- e. Explanation of and response to unexpected conditions;
- f. Location and quantity of soil removed and location and method of disposal, and, any soil restoration activities;
- g. Quality assurance and quality control evaluations;

- h. All existing molybdenum and radium-226 soil data in the area.

24.4 Schedule

Cotter shall conduct these remedial activities according to the following schedule:

1. Within ninety (90) days of the entry of the Consent Decree by the Court, Cotter shall submit the report required by Paragraph 1 of Section 24.3.

2. The State shall act upon the report within sixty (60) days of its receipt.

3. If required, pursuant to Section 24.2, Cotter shall submit a plan for a supplemental soil survey of the site adjacent area within ninety (90) days of action by the State on the report required by Paragraph 1 of Section 24.2.

4. The State shall act upon the supplemental soil survey plan within ninety (90) days of its receipt.

5. Cotter shall complete the supplemental soil survey plan pursuant to the approved schedule.

6. Cotter shall submit a written report on the supplemental soil survey, if required, within sixty (60) days of completion of the supplemental survey and receipt of lab results.

7. The State shall act upon the report on the supplemental soil survey within sixty (60) days after its receipt.

8. Cotter shall submit a written plan to restrict grazing, if required, within sixty (60) days of the determination of background range as defined in Section 3.2.4, or within sixty (60) days of State approval of the supplemental soil survey report, if required, whichever is later.

9. The State shall act upon the grazing restriction plan within sixty (60) days of receipt.

10. Cotter shall complete the erection of fences to restrict grazing pursuant to the approved schedule.

11. Cotter shall submit a written final construction report on the erection of the fences to prevent grazing within one hundred twenty (120) days after the completion of the erection of the fences.

12. The State shall act upon the written final construction report within one hundred twenty (120) days after its receipt.

13. Cotter shall submit, as part of the RAP Annual Report specified in Section 3.1, a written annual summary as described in Paragraph 6 of Section 24.3.

14. The State shall act upon the Annual Report within one hundred and twenty (120) days after its receipt.

15. As an element of mill closure and site reclamation, Cotter shall submit to the State a proposed plan

and schedule to conduct the soil surveys described in Paragraphs 4.a. and b. of Section 24.2.

16. The State shall act upon the proposed plan within ninety (90) days of its receipt.

17. Cotter shall implement the plan pursuant to the approved schedule.

18. Cotter shall submit the results of the soils surveys to the State within sixty (60) days of Cotter's receipt of the laboratory results.

19. The State shall act upon the results within sixty (60) days of receipt.

20. Cotter shall submit to the State a proposed plan and schedule to implement the remedial activities described in Paragraphs 4.c., d., e. and f. of Section 24.2 within sixty (60) days of State action upon the soil survey results.

21. The State shall act upon the proposed plan to implement the remedial activities described in Paragraphs 4.c., d., e. and f. of Section 24.2 within sixty (60) days of its receipt.

22. Cotter shall implement the approved plan pursuant to the approved schedule.

23. Cotter shall submit a written final report within sixty (60) days of the completion of all remedial activities required in Paragraph 4 of Section 24.2.

24. The State shall act upon the written final construction report within sixty (60) days after its receipt.

## 25 LINCOLN PARK SOILS

### 25.1 Description of Operations and Relevant Environmental Conditions

Particulates are dispersed from the sources identified in the remedial action plan to soils off the site.

### 25.2 Remedial Activities

The purpose of these remedial activities is to conduct a gamma scintillometer survey in Lincoln Park and to report the survey results to the Health Risk Assessment Panel and the Colorado Department of Health for analysis.

Cotter shall perform the following remedial activities:

1. Cotter shall conduct a gamma scintillometer study in Lincoln Park, which shall include:
  - a. Scintillometer measurements shall be obtained in Lincoln Park in the area bounded by Ninth Street to the west, Park Avenue to the north, Pinon Avenue to the south, and Willow Street to the east.
  - b. Scintillometer measurements shall be collected at intervals corresponding to the intersections of the public roads in Lincoln Park.
  - c. At each sampling location, one gamma scintillometer measurement shall be

obtained no closer than three (3) meters from the shoulder of the road but not further than thirty (30) meters from the center of the intersection of the public roads.

- d. The gamma scintillometer shall be calibrated in accord with the calibration and measurement procedures consistent with the procedures of the Colorado Department of Health.

25.3 Requisite Assessments and Engineering Activities

Cotter shall prepare and submit to the State the following:

1. A plan for a gamma scintillometer survey as required in Paragraph 1 of Section 25.2, which shall include:
  - a. Description of methods and procedures for the gamma scintillometer survey, including calibration procedures;
  - b. QA/QC Plan;
  - c. Schedule.
2. A written report of the results of the gamma scintillometer survey as required in Paragraph 1 of Section 25.2, which shall also be submitted to the Health Risk Assessment Panel, and which shall include:

- a. Summary of methods and procedures and survey locations;
- b. Data collected;
- c. Map of sample locations with results at each location;
- d. Explanation of and response to unexpected conditions;
- e. Quality assurance and quality control evaluations;
- f. All existing radium-226 soil data in the area.

#### 25.4 Schedule

Cotter shall conduct these remedial activities according to the following schedule:

1. Within ninety (90) days after the entry of the Consent Decree by the Court, Cotter shall submit a plan for the soil gamma scintillometer survey, as required by Paragraph 1 of Section 25.2;
2. The State shall act upon the soil gamma scintillometer survey (see Paragraph 1 of Section 25.2) within ninety (90) days of its receipt.
3. Cotter shall implement and complete the soil gamma scintillometer survey pursuant to the approved schedule.
4. Within sixty (60) days of the completion of the soil gamma scintillometer survey, Cotter shall submit a



written report of the results of the soil gamma scintillometer survey and any existing radium-226 soil data to the State and the Health Risk Assessment Panel.

5. The State shall act upon the soil gamma scintillometer survey within sixty (60) days of its receipt.

6. The Health Risk Assessment Panel shall incorporate the results of the soil gamma survey into the studies required by Section 32.

## 26 WILLOW LAKES

### 26.1 Description of Operations and Relevant Environmental Conditions

Mill-derived constituents are suspected to be present in the lower portion of the Willow Creek drainage. Several small ponds located in this drainage have ground water as their source. These ponds are used for fish stocking and might be used for irrigation.

### 26.2 Remedial Activities

The purpose of these remedial activities is to survey the ground and surface water quality parameters, biota and water uses in the Willow Lakes and feeder springs, and to report the survey results to the Health Risk Assessment Panel and the Colorado Department of Health for analysis.

Cotter shall perform the following remedial activities:

1. Cotter shall conduct a sampling program of the water, sediment and fish in the Willow Lakes and feeder springs. The sampling program shall include at least one fish-stocking season. The sampling program shall include:
  - a. A number of water, sediment, and biota samples from each pond;
  - b. Results of analysis for uranium, molybdenum, and radium-226;
  - c. Documentation of the use of the Willow Lakes;

d. Documentation of the management, of the Willow Lakes, which shall include:

- i. Fish stocking, feeding and harvesting practices;
- ii. Use of algicides;
- iii. Management practices.

26.3 Requisite Assessments and Engineering Activities

Cotter shall prepare and submit to the State for review and approval the following:

1. A plan for a sampling program of the Willow Lakes and feeder springs, which shall include:

- a. Description of sampling;
- b. QA/QC Plan;
- c. Schedule.

2. A written report of the results of the sampling program shall be submitted by Cotter to the State and to the Health Risk Assessment Panel, and which shall include:

- a. Results and data collected;
- b. Explanation of and response to unexpected conditions;
- c. Quality assurance and quality control evaluations.

26.4 Schedule

Cotter shall conduct these remedial activities according to the following schedule:

1. Within one hundred and eighty (180) days after the entry of the Consent Decree by the Court, Cotter shall submit a plan for a sampling program of the Willow Lakes and feeder springs.

2. The State shall act upon the plan for the sampling program within ninety (90) days after its receipt.

3. Cotter shall implement the sampling program pursuant to the approved schedule.

4. Within sixty (60) days after the receipt of the laboratory analytical results, Cotter shall submit to the State of Colorado and Health Risk Assessment Panel a written report of the results of the sampling program.

5. The State shall act upon the report of the sampling program within sixty (60) days after its receipt.

6. The Health Risk Assessment Panel shall incorporate results of the sampling program into the studies required by Section 32.

## 27 EPHEMERAL STREAMS AND FREMONT DITCH

### 27.1 Description of Operations and Relevant Environmental Conditions

Mill-derived particulates dispersed by the wind are deposited in off site soil. These particulates are available to migrate down nearby ephemeral drainages as part of sediment loading during storm events. These drainages include Sand Creek and Willow Creeks. Sand Creek flows to the Arkansas River above the intake of the Fremont Ditch.

Mill-derived constituents are suspected to be present in the sediments in these drainages and the Fremont Ditch. Sediments in these drainages are transported during storm events to the Arkansas River.

### 27.2 Remedial Activities

The purpose of these remedial activities is to survey the radium-226 concentrations in sediments in the ephemeral segments of Sand Creek, Willow Creek and the Fremont Ditch, and, if necessary, remove and properly dispose of the sediments from those segments. The purpose of sediment removal is to reduce radium-226 concentrations to background range.

Cotter shall perform the following remedial activities:

1. Cotter shall conduct a survey of the dry channel segments of Sand Creek, Willow Creek, and in the bed

of Fremont Ditch during that period of the year when it is dry. The survey shall include:

- a. A dry sediment gamma scintillometer survey, along the main channel and at transects every ten (10) meters, calibrated in accord with the calibration and measurement procedures consistent with the procedures of the Colorado Department of Health.
- b. A supplemental sediment sample survey in accord with a sampling protocol approved by the State.
- c. All sediment samples shall be analyzed for radium-226.

2. Based on the results of the survey of the dry channel segments, Cotter shall remove all sediments containing concentrations of radium-226, averaged over areas of 100 square meters, which is greater than the background mean by more than five (5) picoCuries per gram (pCi/g) averaged over the first fifteen (15) centimeters (cm) below the surface.

3. All removed sediments shall be disposed of in the main or secondary impoundments. Sediment removal shall continue until contaminant levels are reduced to background range (see Section 3.2.4) as verified through confirmatory sampling program. The final sediment survey shall be

conducted by calibrated gamma scintillometer survey.

Confirming sediment samples shall be collected and analyzed for radium-226 from those areas where gamma scintillometer readings exceed background range. The sediment removal criterion of this paragraph shall be met.

27.3 Requisite Assessments and Engineering Activities

Cotter shall prepare and submit to the State for review and approval the following:

1. A plan for a survey of the dry channel segments of Sand Creek, Willow Creek, and the Fremont Ditch, which shall include:

- a. Description of methods and procedures for gamma scintillometer survey, including calibration procedures;
- b. Description of methods and procedures for supplemental sediment sample survey;
- c. QA/QC Plan;
- d. Schedule.

2. A written report of the results of the survey of the dry channel segments of Sand Creek, Willow Creek, and the Fremont Ditch, which shall include:

- a. Summary of methods and procedures and survey locations;
- b. Data collected;

- c. Topographic map with approximate grid locations and sample locations with results at each location;
- d. Values and ranges of meter readings;
- e. Findings and conclusions;
- f. Explanation of and response to unexpected conditions and problems;
- g. Quality assurance and quality control evaluations;
- h. If necessary, a plan to remove and dispose of the sediments, which shall include:
  - i. Description of methods and procedures to remove and dispose of the sediments;
  - ii. QA/QC Plan;
  - iii. Schedule.

3. A written final report on the removal and disposal of the sediments from the dry channel segments which shall include:

- a. Description of activities and results;
- b. Quantity of material removed;
- c. Explanation of and response to unexpected conditions and procedures;



- d. Quality assurance and quality control evaluations.

27.4 Schedule

Cotter shall conduct these remedial activities according to the following schedule:

1. Within ninety (90) days after the entry of a Consent Decree by the Court, Cotter shall submit a plan for a survey of the dry channel segments and Fremont Ditch.

2. The State shall act upon the plan for a survey of the dry channel segments and Fremont Ditch within ninety (90) days after its receipt.

3. Cotter shall implement and complete the survey pursuant to the approved schedule. If the Fremont Ditch is not dry during the period of implementation of the survey, it shall be surveyed within sixty (60) days after it is dry.

4. Cotter shall submit a written report of the results of the survey within sixty (60) days of the determination of background range (see Section 3.2.4).

5. The State shall act upon the report of the results of the survey within sixty (60) days after its receipt.

6. Cotter shall remove and dispose of the sediments, if necessary, pursuant to the approved schedule.

7. Within one hundred twenty (120) days after completion of the removal and disposal of the sediments, Cotter shall submit a written final report.

8. The State shall act upon the final report within one hundred twenty (120) days after its receipt.

## 28 PERENNIAL STREAMS

### 28.1 Description of Operations and Relevant Environmental Conditions

Mill-derived particulates dispersed by the wind are deposited in off-site soil. These particulates are available to migrate down nearby drainages as part of sediment loading during storm events. These drainages include Sand Creek and Willow Creek. Sand Creek flows to the Arkansas River above the intake of the Fremont Ditch. Mill-derived constituents are suspected to be present in the sediments in these drainages and the Fremont Ditch. Sediments in these drainages are transported during storm events to the Arkansas River.

### 28.2 Remedial Activities

The purpose of these remedial activities is to survey the molybdenum and radium-226 concentrations in sediments in the perennial segments of Sand Creek and Willow Creek, and, if necessary, to remove and properly dispose of the sediments from those segments. The purpose of sediment removal is to reduce molybdenum and radium-226 concentrations to background range.

Cotter shall perform the following remedial activities:

1. As an element of mill closure and site reclamation, Cotter shall conduct a survey of the sediments in

the perennial segments of Sand Creek and Willow Creek. The survey shall include:

- a. Five (5) sediment samples at the head of Sand Creek and five (5) sediment samples at the head of Willow Creek;
- b. Five (5) sediment samples at the confluence of Sand Creek with the Arkansas River and five (5) sediment samples at the confluence of Willow Creek with the Arkansas River;
- c. All sediment samples shall be obtained at fifty (50) foot intervals along the center of each channel;
- d. All sediment samples shall be obtained within the first fifteen (15) centimeters (cm) below the surface;
- e. All sediment samples shall be analyzed for radium-226 and molybdenum;

2. Based on the results of the survey of the perennial segments, Cotter shall submit a sampling and remediation plan to investigate the extent of necessary remediation for:

- a. All sediments containing concentrations of radium-226, averaged over areas of 100 square meters, which is greater than

the background mean by more than five (5) picoCuries per gram (pCi/g) averaged over the first fifteen (15) centimeters (cm) below the surface, and

- b. All sediments containing concentrations of molybdenum, averaged over areas of 100 square meters, which is greater than the background range by more than five (5) milligrams per kilogram (mg/kg) averaged over the first fifteen (15) centimeters (cm) below the surface.

3. Based on the results of the perennial sampling survey and sampling and remediation plan, Cotter shall remove:

- a. All sediments containing concentrations of radium-226, averaged over areas of 100 square meters, which is greater than the background mean by more than five (5) picoCuries per gram (pCi/g) averaged over the first fifteen (15) centimeters (cm) below the surface, and
- b. All sediments containing concentrations of molybdenum, averaged over areas of 100 square meters, which is greater than the background range by more than five

(5) milligrams per kilogram (mg/kg)  
averaged over the first fifteen (15)  
centimeters (cm) below the surface.

All removed sediments shall be disposed of in the main or secondary impoundments. Sediment removal shall continue until molybdenum and radium-226 concentrations are reduced to background range. A verification program shall be conducted by Cotter in accordance with a sampling protocol approved by the State. All sediment samples shall be analyzed for radium-226 and molybdenum.

28.3 Requisite Assessments and Engineering Activities

Cotter Corporation shall prepare and submit to the State for review and approval the following:

1. A plan for a survey of the sediments in the perennial segments of Sand Creek and Willow Creek, which shall include:

- a. Description of methods and procedures for sediment sample survey;
- b. QA/QC Plan;
- c. Schedule.

2. A written report of the results of the survey of the perennial segments of Sand Creek and Willow Creek, which shall include:

- a. Summary of methods, procedures, and survey locations;

- b. Data collected;
- c. Map of sample locations with results at each location;
- d. Findings and conclusions;
- e. Explanation of and response to unexpected conditions and problems;
- f. Quality assurance and quality control evaluations;
- g. A sampling and remediation plan to investigate the extent of necessary remediation, which shall include:
  - i. Description of methods and procedures for sediment sample survey;
  - ii. QA/QC Plan;
  - iii. Schedule.

3. A written report of the results of the sampling and remediation plan, which shall include:

- a. Summary of methods, procedures, and survey locations;
- b. Data collected;
- c. Map of sample locations with results at each location;
- d. Findings and conclusions;

- e. Explanation of and response to unexpected conditions and problems;
- f. Quality assurance and quality control evaluations;
- g. A plan to remove and dispose of the sediments which shall include:
  - i. Description of methods and procedures to remove and dispose of the sediments;
  - ii. QA/QC Plan;
  - iii. Schedule;
  - iv. Verification protocol.

4. A written final report on the removal and disposal of the sediments from the perennial segments, which shall include:

- a. Description of activities and results;
- b. Quantity of material removed;
- c. Explanation of and response to unanticipated conditions and problems;
- d. Quality assurance and quality control evaluations.

28.4 Schedule

Cotter shall conduct these remedial activities according to the following schedule:



1. Cotter shall submit a plan for a survey of the perennial segments of Sand Creek and Willow Creek one hundred and twenty (120) days prior to mill closure and site reclamation.

2. The State shall act upon the plan for a survey of the perennial segments prior to mill closure and site reclamation.

3. Cotter shall implement the approved survey of the sediments in the perennial segments of Sand Creek and Willow Creek as part of mill closure and site reclamation.

4. Cotter shall submit the report required by Paragraph 2 of Section 28.3, including the verification protocol, to the State within sixty (60) days of Cotter's receipt of the laboratory analysis results.

5. The State shall act upon this submittal within sixty (60) days of receipt.

6. If necessary, Cotter shall implement the approved sampling and remediation plan described in Paragraph 2.g. of Section 28.3 according to the approved schedule.

7. Cotter shall submit a final report describing the results of the remedial activities to the State within sixty (60) days of completion of the activities.

8. The State shall act on this submittal within sixty (60) days of its receipt.

## 29 PATHWAY MANAGEMENT

### 29.1 Description of Operations and Relevant Environmental Conditions

Mill-derived particulates dispersed by the wind are deposited in off-site soils. These particulates are available to migrate down nearby ephemeral drainages as part of sediment loading during storm events. These drainages include Sand Creek, Willow Creek, Forked Gulch, Wolf Park, and Chandler Creek. Mill-derived constituents are suspected to be present in the sediment in these drainages. Sediments in these drainages are transported during storm events to the Arkansas River.

### 29.2 Remedial Activities

The purpose of these remedial activities is to effectively minimize and mitigate the potential transport of soils and sediments in ephemeral drainage surface runoff during storm events to the Arkansas River and to effectively minimize and mitigate the concentrations of molybdenum, radium-226 and, if appropriate, thorium-230 in these drainages.

Cotter shall perform the following remedial activities:

1. Cotter shall design and conduct a sub-basin release soils study for each defined drainage sub-basin, the approximate boundaries of which are indicated in Figure 1-2.

A sub-basin release soils study shall  
include:

- a. A gamma scintillometer survey in accordance with the calibration and measurement procedures consistent with the procedures of the Colorado Department of Health.
- b. A soil sampling program shall be conducted by Cotter in accordance with a sampling protocol approved by the State which will supplement the scintillometer survey. All sediment samples shall be analyzed for radium-226, molybdenum and, thorium-230, except that the elimination of thorium-230 analyses due to correlation of thorium-230 concentrations with either the molybdenum or radium-226 concentrations shall, if appropriate, be permitted by the State.

2. Within one (1) year following completion of any sub-basin release soils study and the determination of background range (see Section 3.2.6), any discovered areas of soil concentrations above background range shall, at Cotter's discretion, either be removed or remediated by the

construction of a site-specific silt fence by Cotter. The mean concentration of radium-226, molybdenum and, if appropriate pursuant to Paragraph 1.b. of Section 29.2, thorium-230 in the soil samples over the first fifteen (15) centimeters (cm) below the surface shall be used to determine whether remediation to background range has been accomplished.

3. If Cotter elects to remediate any sub-basin by construction and maintenance of a silt fence pursuant to Paragraph 2 of this Section, then the following shall apply:

- a. Each silt fence shall be designed to filter and remove transported sediment from surface runoff;
- b. Each silt fence shall be constructed and operational pursuant to the approved schedule set forth in the report required by Paragraph 3 of Section 29.3;
- c. Each silt fence shall be constructed of commercially available filter material, that has a minimum flow rating of four hundred (400) gallons per minute (gpm);
- d. Each silt fence shall be constructed in accordance with the manufacturer's specifications of the filter material, if available, or specifications approved

by the State if manufacturer's specifications are not available.

- e. Except as described below, each silt fence shall be installed in a sub-basin not greater in area than 150 acres. Silt fences can be site-specifically designed for areas greater than 150 acres when capable of passing runoff attributable to at least a fifty-year recurrence interval flow.
- f. Each silt fence shall be designed to prevent mechanical and/or structural failure. Failure means physical collapse, overtopping or underflow of runoff, or any occurrence such that the fence does not function to filter sediment material.
- g. If any silt fence experiences frequent failure, it shall be redesigned to prevent frequent mechanical and/or structural failure and replaced. Frequent failure means the failure of any silt fence more than once per year or three (3) or more sequential annual failures. Structural design

improvements shall not be required to exceed the design requirements of a rigid overtoppable structure;

- h. Any silt fence that has experienced a failure shall be repaired or replaced within ten (10) days of notice to or knowledge of Cotter of the failure;
- i. The sediments retained by each silt fence shall be removed and disposed of in the main or secondary impoundment when the depth of the sediments retained by a silt fence exceeds a nominal depth of one (1) foot.
- j. Samples of the sediments retained by each silt fence shall be collected and analyzed for radium-226, molybdenum, and thorium-230, except that analyses for thorium-230 may be eliminated based on the correlation developed in Paragraph 1.b of Section 29.2 and approved by the State. Sediment sample collection and analysis shall occur at intervals not less than ninety (90) days, except that at least one sample shall occur prior to each time the sediments retained by a

silt fence are removed and disposed and at least one sample shall occur annually.

- k. A silt fence shall be maintained until removed, which may occur when either:
  - i. the mean concentrations of radium-226, molybdenum and, if appropriate, pursuant to Paragraph 1.b. of Section 29.2, thorium-230 in the monitoring data for a silt fence location is not greater than the background range of radium-226, molybdenum or, if appropriate pursuant to Paragraph 1.b. of Section 29.2, thorium-230. The monitoring data shall consist of the data obtained in accordance with Subparagraph j from four (4) sequential representative samples or;
  - ii. the monitoring data establishes the existence of a steady state condition. The existence of a steady state condition shall be determined, in accord with Section

3.2.7, using a linear regression on five (5) years of data obtained in accord with Subparagraph j.

4. Cotter shall design and conduct a sub-basin release soils study as described in Paragraph 1 of Section 29.2 prior to the removal of a silt fence, in accordance with Paragraph 3.1. of Section 29.2.

29.3 Requisite Assessments and Engineering Activities

Cotter shall prepare and submit to the State for review and approval the following:

1. A plan for sub-basin release soil studies, which shall include:

- a. A gamma scintillometer survey;
- b. A soil sample survey to confirm the results of the gamma scintillometer survey;
- c. Survey procedures and methodology;
- d. Locations of sampling;
- e. QA/QC Plan;
- f. Schedule.

2. A written report on the results of the sub-basin release soil studies, which shall include:

- a. Topographic map with approximate grid locations;
- b. Values and ranges of meter readings;



- c. Locations of soil samples;
- d. Results of laboratory analysis of soil samples;
- e. Quality assurance and quality control evaluations.

3. A plan for the construction and maintenance of the silt fences or soil removal, as appropriate, which shall include:

- a. Location of each proposed silt fence or soil removal;
- b. Design drawings and construction specifications and materials;
- c. QA/QC Plan;
- d. Maintenance plan;
- e. Sediment or soil removal and disposal plan;
- f. Sampling plan;
- g. Schedule.

4. A written final report which shall include, as appropriate:

- a. Description of action taken;
- b. As-built drawings;
- c. Explanation of and response to unexpected conditions and problems;

- d. Quality assurance and quality control evaluations;
- e. Schedule.

5. A written annual activities summary as part of the RAP Annual Report specified in Section 3.1, which shall include:

- a. Data collected;
- b. Analysis of monitoring data and background range for each silt fence;
- c. Analysis of steady state condition for each silt fence;
- d. Description of maintenance activities for each silt fence;
- e. Description of failures and repairs and replacements for each silt fence;
- f. Description of removal and disposal of retained sediments for each silt fence;
- g. Explanation of and response to unexpected conditions and problems;
- h. Quality assurance and quality control evaluations.

6. A written proposal for the removal of any silt fence, which shall include:

- a. The basis for the removal of the silt fence, in accord with Paragraph 3.k. of Section 29.2;

b. A plan to remove any remaining areas of soil containing mean concentrations of radium-226, molybdenum or, if appropriate pursuant to Paragraph 1.b. of Section 29.2, thorium-230 so that constituent concentrations are reduced to background range, or a plan to construct and maintain a silt fence for any smaller drainage area upstream of the silt fence proposed to be removed where the mean concentrations data for radium-226, molybdenum, or, if appropriate pursuant to Paragraph 1.b. of Section 29.2, thorium-230 are greater than the background range for radium-226, molybdenum, or, if appropriate pursuant to Paragraph 1.b. of Section 29.2, thorium-230.

29.4 Schedule

Cotter shall conduct these remedial activities according to the following schedule:

1. Cotter shall submit a plan for the sub-basin release soil studies within ninety (90) days after entry of the Consent Decree by the Court.

2. The State shall act upon Cotter's plan for sub-basin release soil studies within ninety (90) days of receipt.

3. Cotter shall implement the plan for sub-basin soils studies in accordance with Paragraph 1 of Section 29.2 at a rate of two sub-basins per year until all sub-basins identified in Figure 1-2 have been studied. These studies shall be completed pursuant to the approved schedule.

4. Cotter shall submit a written report on the results of the sub-basin release soil studies within sixty (60) days of the completion of the survey in each sub-basin and the receipt of background data.

5. The State shall act upon the sub-basin release soil study report within sixty (60) days of its receipt.

6. Cotter shall submit a plan and schedule for the construction and maintenance of silt fences or for soil removal within sixty (60) days of State action upon the sub-basin release soil study report.

7. The State shall act upon the plan and schedule within sixty (60) days of its receipt.

8. Cotter shall submit a written final report within one hundred twenty (120) days after the completion of the construction of any silt fences.

9. The State shall act upon the final report within thirty (30) days after its receipt.

10. Cotter shall submit as part of the RAP Annual Report specified in Section 3.1 a written annual activities summary as described in Section 29.3.

11. The State shall act upon each annual report within one hundred and twenty (120) days of its receipt.

12. Cotter shall notify the State sixty (60) days prior to removal of any silt fence.

13. The State shall act upon a written proposal submitted by Cotter to remove a silt fence within thirty (30) days of receipt.

## 30 ARKANSAS RIVER

### 30.1 Description of Operations and Relevant Environmental Conditions

Mill-derived particulates dispersed by the wind are deposited in off-site soils. These particulates are available to migrate down nearby ephemeral drainages as part of sediment loading during storm events. RAP activities are designed to minimize and mitigate such migration. Data concerning the impacts of storm event sediment loadings on the water quality are not available.

### 30.2 Remedial Activities

The purpose of this study is to evaluate the adequacy of the on-going river monitoring program and its ability to measure the effectiveness of RAP activities.

Cotter shall perform the following remedial activities:

1. Cotter shall design and conduct a preliminary study to document the performance and effectiveness of remediation efforts as they affect the Arkansas River and its ephemeral and perennial surface water tributaries in the vicinity of the mill site. The overall reach of the Arkansas River to be monitored shall be sufficient in length to monitor spatial variability. The proposal shall identify the constituents to be studied and shall address a study of stream flows, water quality, sediments, macroinvertebrates, and fish populations. It is anticipated that the preliminary study

should, for example, examine seasonal events and should contemplate an intensive sampling effort including three replicated water samples over fifteen sample periods within a five-day time frame, with sediment sampling coincident with water sampling, and programmed macroinvertebrate collection.

2. Cotter shall initiate the preliminary study coincident with the next spring runoff period following State approval and continue it through the spring runoff period of the following year.

3. Cotter shall modify its current monitoring program of the Arkansas River based on the results of the preliminary study.

30.3 Requisite Assessments and Engineering Activities

Cotter shall prepare and submit to the State for review and approval the following:

1. A plan for this study which shall include:
  - a. Description of sampling efforts;
  - b. Description of constituents to be studied;
  - c. QA/QC Plan;
  - d. Schedule.
2. A written final report of the results of this study which shall include:
  - a. Description of activities;
  - b. Data collected;

- c. Findings and conclusions;
- d. Quality assurance and quality control  
evaluation;
- e. Explanation of and response to  
unexpected conditions and problems.

3. A plan for modifying the ongoing performance monitoring of the Arkansas River, if necessary, which shall include:

- a. Proposed modifications to the current monitoring conducted in accordance with the Radioactive Materials License;
- b. Quality Assurance/Quality Control (QA/QC) plan;
- c. Schedule.

4. Annual activities summary of the performance monitoring program, which shall include:

- a. Data collected;
- b. Quality assurance and quality control evaluations.

30.4 Schedule

Cotter shall conduct these remedial activities according to the following schedule:

1. Within one hundred and eighty (180) days after the entry of a Consent Decree, Cotter shall design and submit a plan for this study to the State.



2. The State shall act upon said plan within one hundred and twenty (120) days after its receipt.

3. Cotter shall start this study coincident with the start of spring runoff following approval of the plan.

4. Cotter shall continue the study through the end of spring runoff of the year following the start of the study.

5. Within one hundred and eighty (180) days following the receipt by Cotter of all laboratory analysis, Cotter shall submit a written final report of the results of the study to the State and the Health Risk Assessment Panel, including a proposal for any modification of the performance monitoring program.

6. The State shall act upon the final report of the results of the study within one hundred and twenty (120) days after its receipt.

7. Cotter shall implement the approved ongoing performance monitoring program within thirty (30) days of receipt of State approval of the plan.

8. Cotter, as part of the RAP Annual Report specified in Section 3.1, shall submit an annual summary of the performance monitoring program as described in Paragraph 4 of Section 30.3.

9. The State shall act upon the annual summary within one hundred twenty (120) days of its receipt.

### 31 MINNEQUA RESERVOIR AND PUEBLO RESERVOIR

#### 31.1 Description of Operations and Observed Impacts

The Arkansas River flows to the Minnequa and Pueblo Reservoirs. Sediment material in the Arkansas River settles out in the Minnequa and Pueblo Reservoirs.

#### 31.2 Remedial Activities

The purpose of these remedial activities is to define the existing concentrations of specified elements in the sediments of the Minnequa Reservoir and the Pueblo Reservoir.

The State may conduct or may have conducted, as appropriate, a study of sediment cores of the Minnequa and Pueblo Reservoirs. Cotter may observe sample collection procedures, and will have access to split samples if sufficient sample volume is available. If conducted, the study shall include:

- a. Sediment core samples shall be collected from each of the two reservoirs.
- b. The number of sediment core samples for each location shall not be greater than twelve (12);
- c. Each sample shall consist of two sediment cores; one sediment core shall be maintained in an appropriate archive, and the other sediment core shall be

- analyzed by an appropriate laboratory to be agreed upon by the parties;
- d. Each sediment core to be analyzed shall be divided into the following depth segments:
- i. Zero (0) to two (2) centimeters (cm);
  - ii. Two (2) to five (5) centimeters (cm);
  - iii. Five (5) to ten (10) centimeters (cm);
  - iv. Ten (10) to twenty (20) centimeters (cm);
  - v. Twenty (20) to thirty (30) centimeters (cm);
  - vi. Below thirty (30) centimeters (cm).
- e. Each sediment core segment shall be analyzed only for radium-226, thorium-230, molybdenum and nickel;
- f. The results of each laboratory analysis shall be subjected to a two-way analysis of variance with blocking by location and depth;

- g. Contouring shall be used to further establish the concentrations of radium-226, thorium-230, molybdenum and nickel;
- h. Cotter may observe the collection of the sediment cores.

31.3 Requisite Assessments and Engineering Activities

Pursuant to the analysis to be conducted as described in Section 31.2, a written report shall be prepared which shall include:

- a. Description of activities;
- b. Data collected;
- c. Findings and conclusions;
- d. Explanation of and response to unexpected conditions and problems;
- e. Quality assurance and quality control evaluations.

31.4 Schedule

The State shall provide a copy of the report of the results of the study of the sediment cores of the Minnequa and Pueblo Reservoirs to Cotter within thirty (30) days of the completion of the report.

## 32 HEALTH RISK ASSESSMENT

### 32.1 Description of Operations and Observed Impacts

Mill derived constituents are released into the environment, and are present in the ground water, air and soils. There are potential routes of exposure from the environment to humans. The present data are insufficient to determine if there is an effect on human health.

### 32.2 Remedial Activities

The purpose of these remedial activities is to determine if the release of mill derived constituents has an effect on human health.

Cotter shall perform and the State shall be given the opportunity to participate, as specified below, in the following remedial activities:

1. Cotter shall have a health assessment panel comprised of at least three (3) qualified and independent persons with expertise in medicine, toxicology, epidemiology, public health, or human health effects associated with exposure to radionuclides and metals to design and conduct a comprehensive study to assess the human health risks and impacts, if any, attributable to mill derived constituents. The geographic boundaries shall include the off-site area in the vicinity of the mill site, including Lincoln Park and Canon City. The study shall include:

- a. An assessment of human health risks and impacts associated with:
- i. Consumption of impacted ground water;
  - ii. Consumption of impacted surface water;
  - iii. Exposure to impacted soils and sediments;
  - iv. Inhalation of radon gas or impacted airborne dust;
  - v. Consumption of fish from impacted surface water bodies;
  - vi. Consumption of fruits and vegetables irrigated with impacted water;
  - vii. Consumption of milk from cows that have consumed impacted water;
  - viii. Consumption of meat from livestock that have consumed impacted water or feed.
- b. A multi-dimensional risk assessment matrix using an estimate of human health risk, considering, as appropriate, sensitive segments of the population, as the dependent variable, and using hazard

potential and mechanism of exposure as the independent variable;

- c. Phases for problem definition, design of methodology, completion of sampling and methodology, generation of written report and recommendations for future action;
- d. The review and integration of appropriate information, obtained as a result of the remedial activities conducted as described in this RAP.
- e. Sampling.

32.3 Requisite Assessments and Engineering Activities

Cotter shall prepare, or for Paragraphs 2 and 3 have prepared by the Health Risk Assessment Panel, and submit to the State for review and approval the following:

- 1. A written proposal identifying the persons who will design and conduct the health risk assessment, which shall include:
  - a. Identity of each person;
  - b. Curriculum vitae of each person;
  - c. Experience in the design and conduct of health risk assessment;
  - d. All relevant past experience;

2. A plan for the design and implementation of a study to assess the human health risks and impacts, which shall include:

- a. Description of activities and goals;
- b. Description of procedures and methodologies, including the proposed name of a volunteer local community representative who will act as a liaison between the panel and the community for the purposes of information exchange between these two groups. (The minimum qualifications of this volunteer local community representative are: resident in the area for no less than three (3) years and medical doctor or Ph.D. in a physical or biological science);
- c. Consideration and integration of appropriate information, as determined by the panel, generated as a result of the remedial activities being conducted pursuant to this RAP and any relevant reports or findings prepared by the Agency for Toxic Substances and Disease Registry (ATSDR).



- d. QA/QC Plan;
- e. Schedule.

3. A written interim report on the study to assess human health risks and impacts, which shall include:

- a. Description of activities and results;
- b. Recommendations for future action, considering ATSDR's recommendation;
- c. Quality assurance and quality control evaluation;
- d. Explanation of and response to unexpected conditions and problems.

4. A written report stating findings and conclusions of the Health Risk Assessment Panel regarding any site-related reports submitted to the panel by Cotter, the State or the ATSDR, including reports of the ground water survey (see Section 13), Lincoln Park soil survey (see Section 25), Willow Lakes study (see Section 26), and the Arkansas River (see Section 30).

5. A written final report of the results of the study to assess human health risks and impacts, which shall include:

- a. Description of activities and results;
- b. Recommendations for future action, considering ATSDR's recommendation;

- c. Quality assurance and quality control evaluation;
- d. Explanation of and response to unexpected conditions and problems.

32.4 Schedule

Cotter shall conduct these remedial activities according to the following schedule:

1. Within sixty (60) days of the entry of the Consent Decree by the Court, Cotter shall submit a written proposal identifying the persons who will design and conduct the health risk assessment.

2. The State shall act upon the written proposal within thirty (30) days after its receipt.

3. Within one hundred and twenty (120) days after approval of the written proposal, Cotter shall have the health assessment panel prepare and Cotter shall submit a plan for the design and implementation of a study to assess human health risks and impacts, if any.

4. The State shall act upon the plan within ninety (90) days after its receipt.

5. Within one hundred and eighty (180) days of the approval of the plan, Cotter shall have the Health Risk Assessment Panel implement the plan and submit a written interim report.

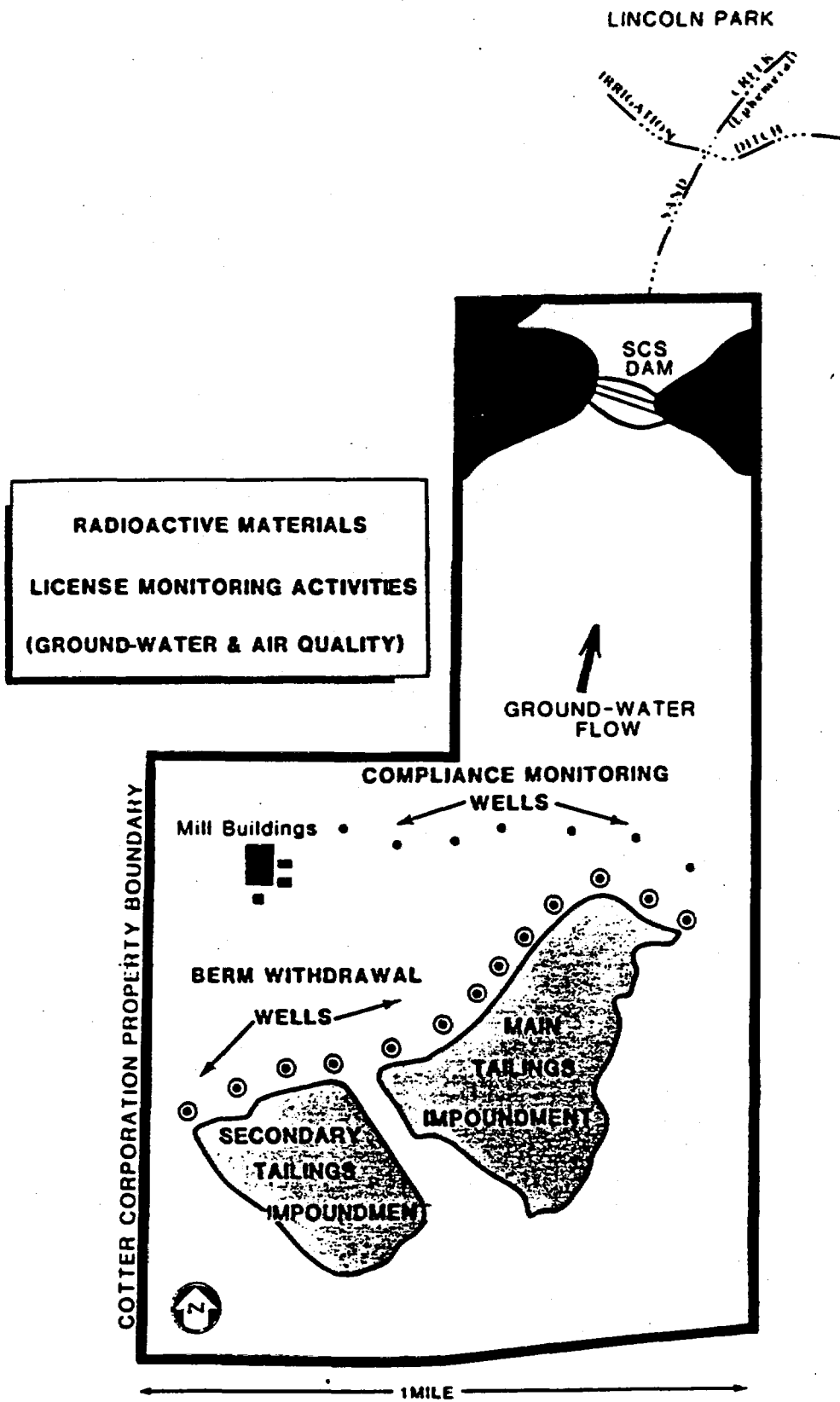
6. The State shall act upon the interim report within thirty (30) days of receipt.

7. Within one hundred and twenty (120) days of receipt of any reports submitted to the Health Risk Assessment Panel, Cotter shall have the Health Risk Assessment Panel submit a written report pursuant to Paragraph 4 of Section 32.3 to the State.

8. The State shall act on the reports within thirty (30) days of receipt.

9. Within one hundred and eighty (180) days after the completion of the assessments, Cotter shall have the Health Risk Assessment Panel prepare the final written report, and Cotter shall submit it to the State.

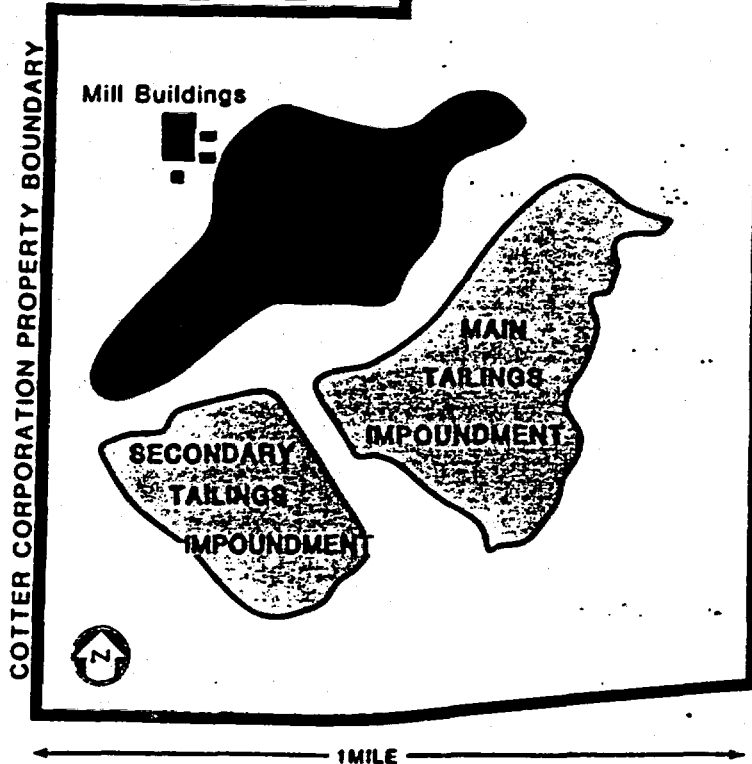
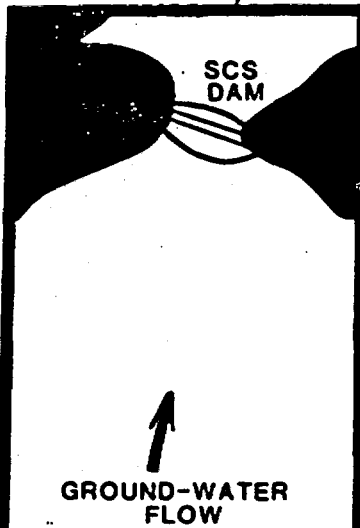
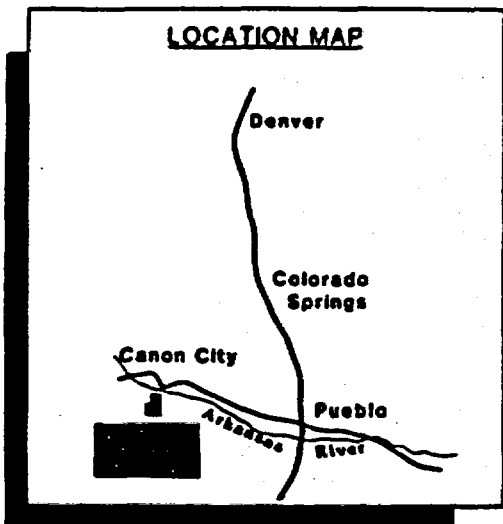
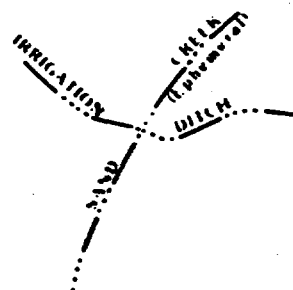
10. The State shall act upon the final written report within one hundred twenty (120) days of its receipt.



**COTTER CORPORATION URANIUM MILL SITE**  
**Canon City, Colorado**

**AFTER REMEDIAL ACTIVITES**

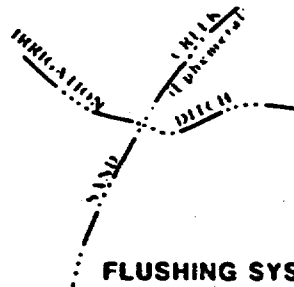
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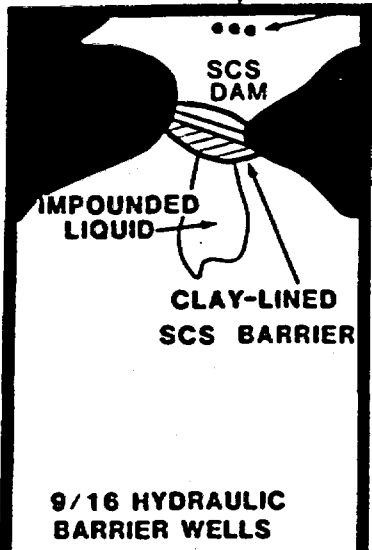
**COTTER CORPORATION URANIUM MILL SITE**  
Canon City, Colorado

**LINCOLN PARK SOIL & WATER-USE SURVEY**

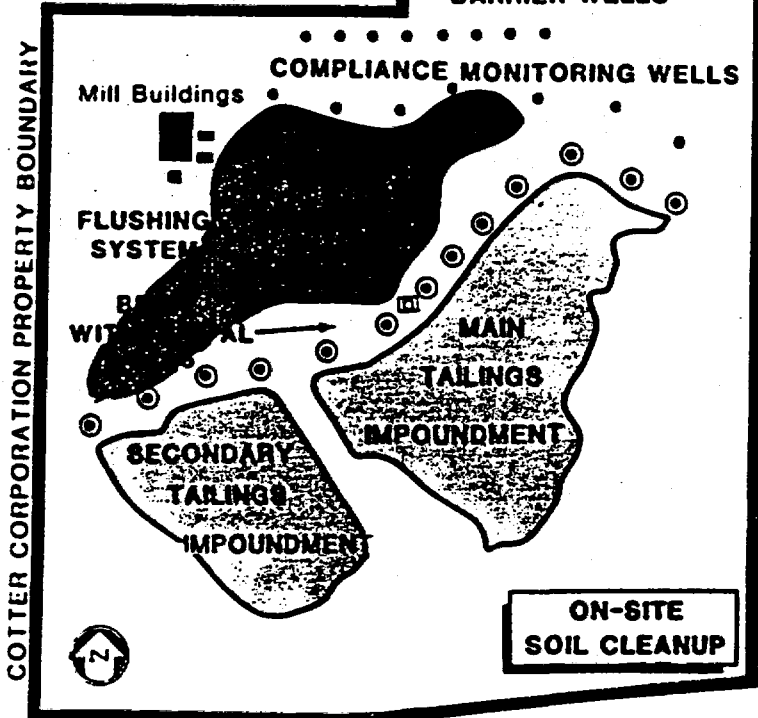
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**OFF-SITE SOIL, SEDIMENT, & SURFACE-WATER SAMPLING & CLEANUP**



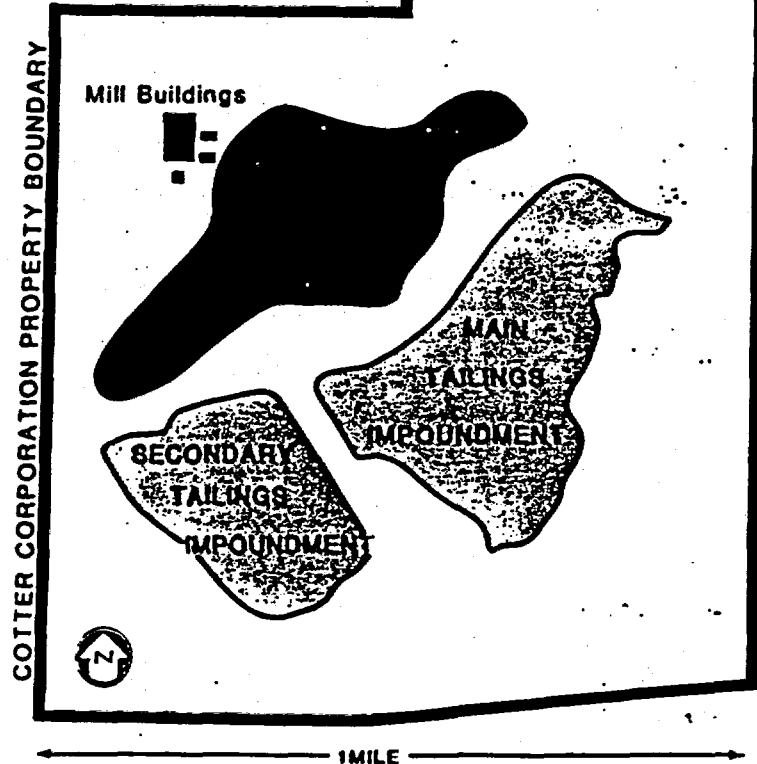
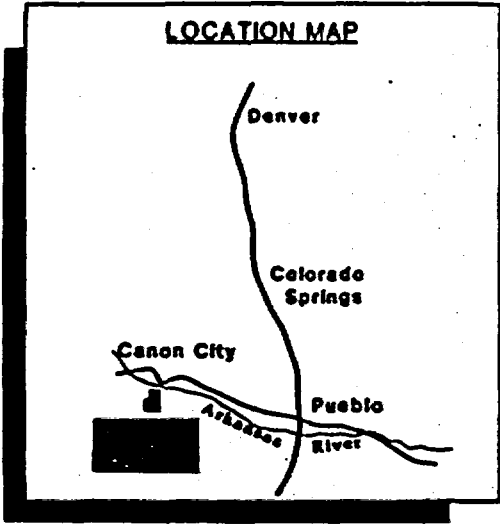
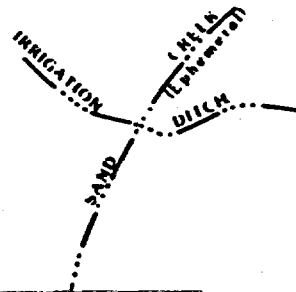
**AIR-QUALITY MONITORING**



1 MILE

**COTTER CORPORATION URANIUM MILL SITE**  
Canon City, Colorado  
**COTTER SITE REMEDIAL ACTIVITIES**

LINCOLN PARK



**COTTER CORPORATION URANIUM MILL SITE**  
Canon City, Colorado



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FILE PLAN

6.2

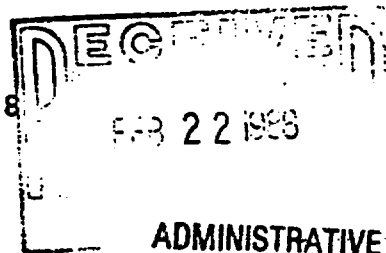
CERCLA LITIGATION SECTION  
ONE CIVIC CENTER PLAZA  
1560 Broadway, Suite 250  
Denver, Colorado 80202  
PH: (303) 866-4343 & 866-4344

The State of Colorado

DEPARTMENT OF LAW  
OFFICE OF THE ATTORNEY GENERAL

Duane Woodard  
Attorney General  
Charles B. Howe  
Chief Deputy Attorney General  
Richard H. Forman  
Solicitor General

February 19, 1988



ADMINISTRATIVE  
RECORD

Catharine Teter  
Assistant Regional Counsel  
U.S. Environmental Protection Agency  
999 Eighteenth Street, Suite 500  
Denver, Colorado 80202-2405

Re: State of Colorado v. Cotter Corporation, Civil Action No.  
83-C-2389

Dear Joni:

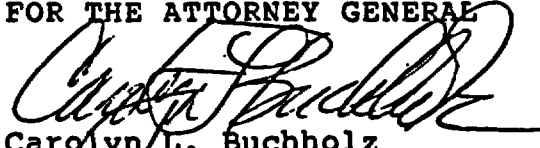
Enclosed for your information and records are the final Consent Decree, and Plaintiff State of Colorado's Response Summary, and a marked up version of the RAP changes made in response to public comments. With regard to the RAP changes, I have only enclosed those pages and sections where changes were made. I believe the format, bold print for new material, and dashes for deleted material, will facilitate your review of the changes.

If you have any questions regarding the enclosed material, please don't hesitate to call me at 894-2289. I suggest that you contact either Mike Hope or Diane Brown to establish a meeting schedule to discuss EPA's technical concerns.

It has been a pleasure working with you.

Sincerely,

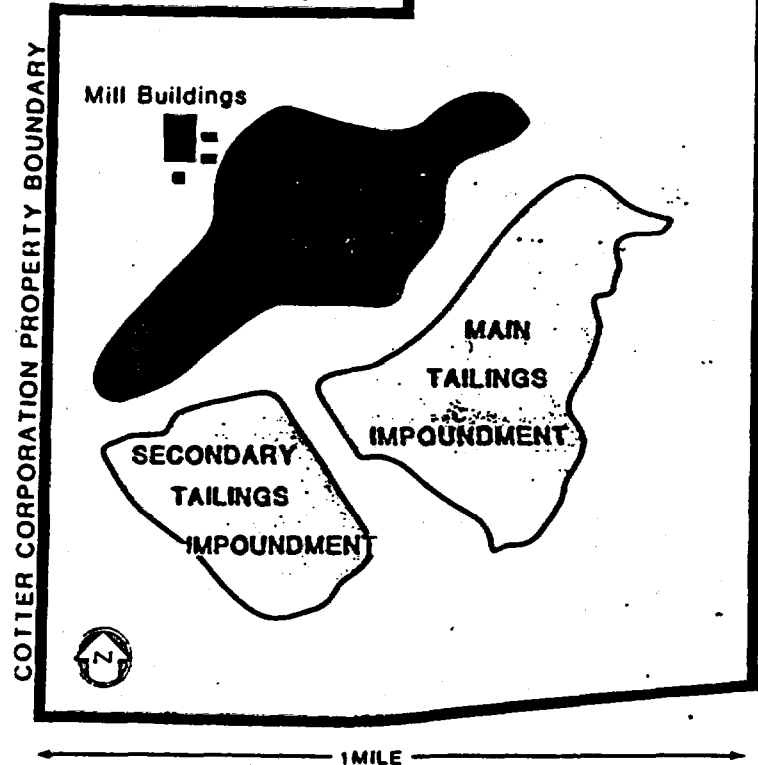
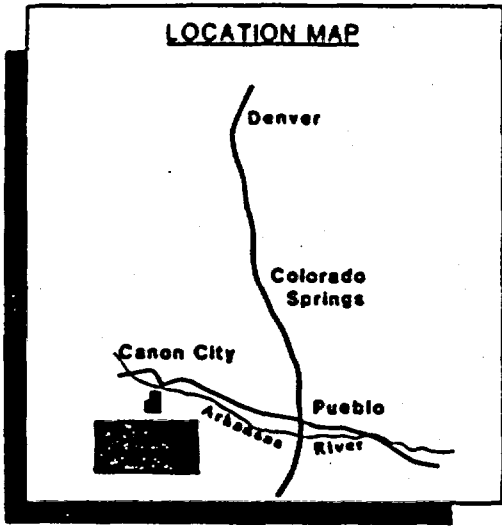
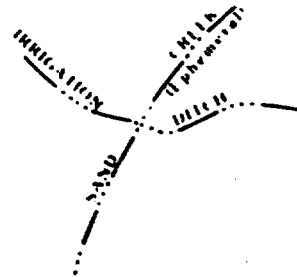
FOR THE ATTORNEY GENERAL

  
Carolyn L. Buchholz  
Assistant Attorney General  
CERCLA Litigation Section

CLB:jmb



LINCOLN PARK



**COTTER CORPORATION URANIUM MILL SITE**  
Canon City, Colorado

- n. computer program documentation, if applicable;
- o. procedures for follow-up of anomalous data.

2. Documentation of consideration and incorporation of applicable guidelines and requirements for sampling and analysis established by the U.S. Environmental Protection Agency, the U.S. Nuclear Regulatory Commission, and the Colorado Department of Health;

3. Proposed laboratory facility or facilities to be used in analyzing samples, if applicable.

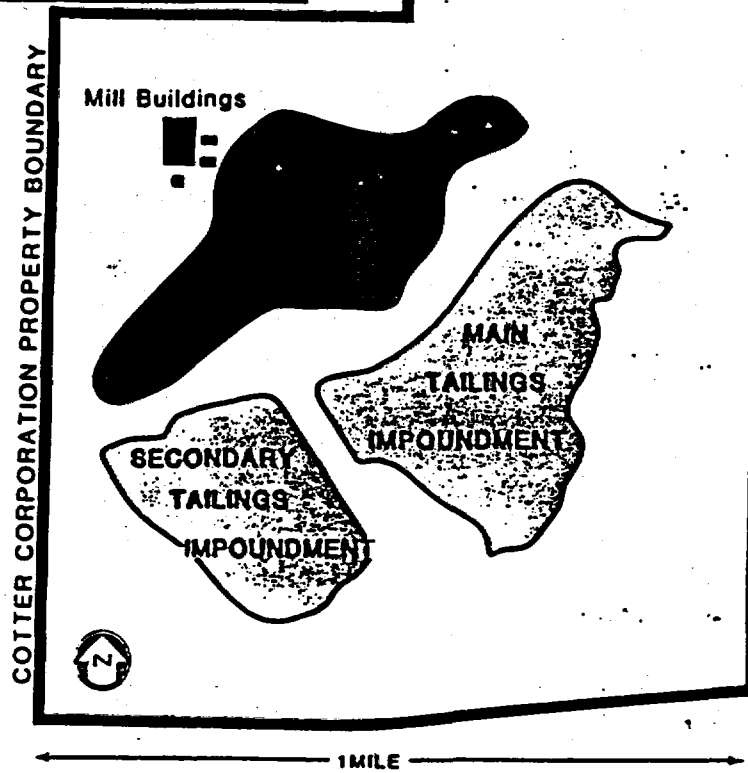
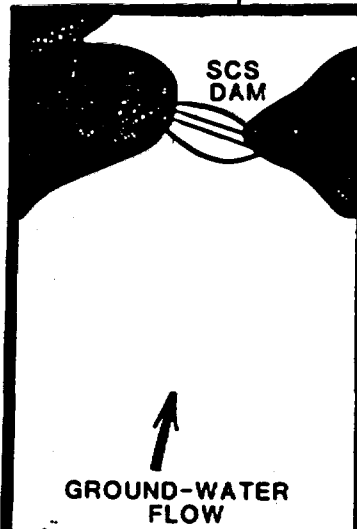
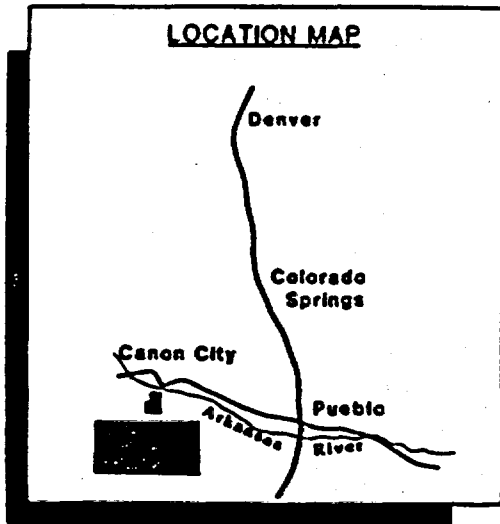
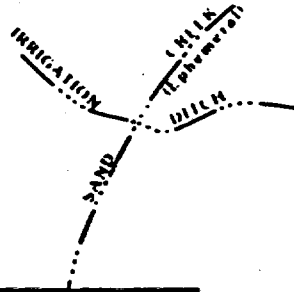
### 3.2.3 Soils and Sediment Analysis

Except for samples collected in accordance with Sections 21 (On-site Soils) and 24 (Site Adjacent Soils), all soil and sediment samples shall be sieved with stainless steel mesh. The less than 100 mesh fraction shall be analyzed after preparation with a nitric acid/perchloric acid (HNO<sub>3</sub>/HClO<sub>4</sub>) digestion. The data shall be analyzed and reported on an air dry weight basis. ✓

### 3.2.4 Background Data Set for Soils and Sediments

Unless specifically stated otherwise, the background data set for soils and sediments, which shall be used in calculating background mean and background range, as further defined below, shall be collected according to the schedule in Paragraph 6 of this Section 3.2.4 and the following criteria and requisite assessments. The "target elements" are uranium, molybdenum, radium-226, and, as

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**COTTER CORPORATION URANIUM MILL SITE**  
Canon City, Colorado

- d. Proposed modifications of operations and maintenance plan.

4.4 Schedule

Cotter shall conduct these remedial activities according to the following schedule:

1. Within ninety (90) days after the entry of a Consent Decree by the Court, Cotter shall submit to the State a plan for the design, construction and operation of the withdrawal well system, which includes the piezometer monitoring program.

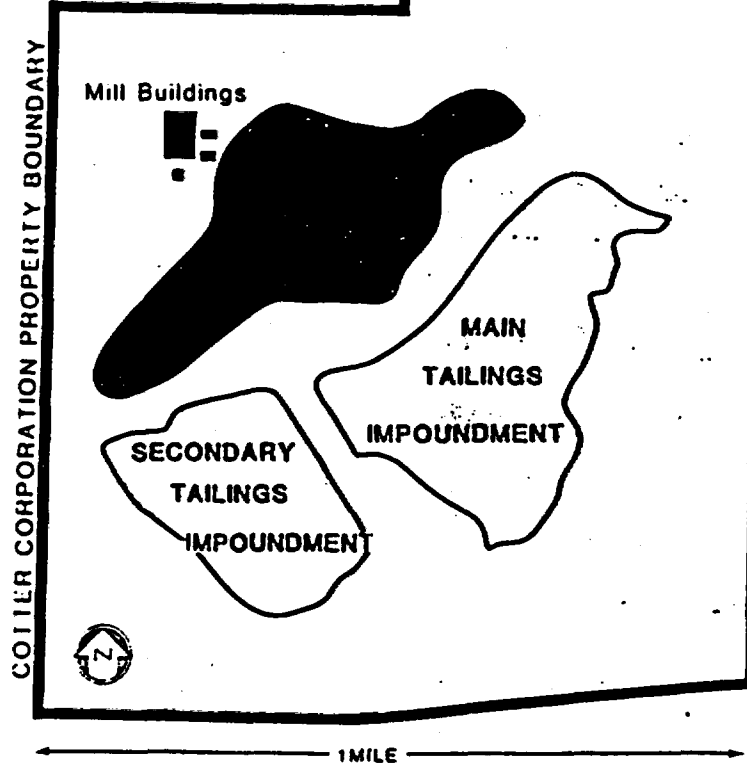
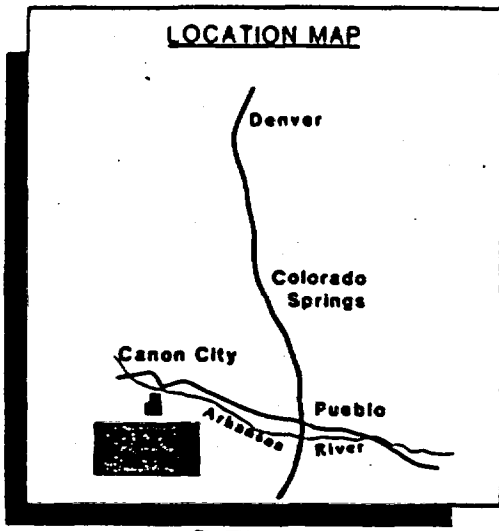
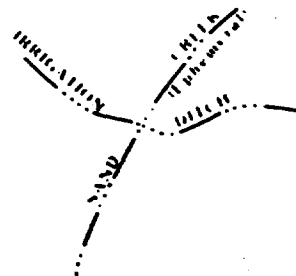
2. The State shall act upon the plan for the design, construction and operation of the withdrawal well system within ninety (90) days of its receipt.

3. Cotter shall complete the construction and start the operation of the withdrawal well system pursuant to the approved schedule required by Paragraph 1 of Section 4.3, but in no event later than September 30, 1989.

4. Cotter shall submit a written final construction report to the State within one hundred twenty (120) days of the completion of the construction of the withdrawal well system.

5. The State shall act upon the final construction report within one hundred twenty (120) days of its receipt.

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**COTTER CORPORATION URANIUM MILL SITE**  
Canon City, Colorado

13.4 Schedule

Cotter shall conduct these remedial activities according to the following schedule:

1. Within one hundred fifty (150) days after the entry of the Consent Decree by the Court, Cotter shall submit to the State a design for a water use survey plan.

2. The State shall act upon the water use survey plan within sixty (60) days of its receipt.

3. By no later than ~~December 1, 1988~~ March 1, 1989, Cotter shall complete the water use survey. ✓

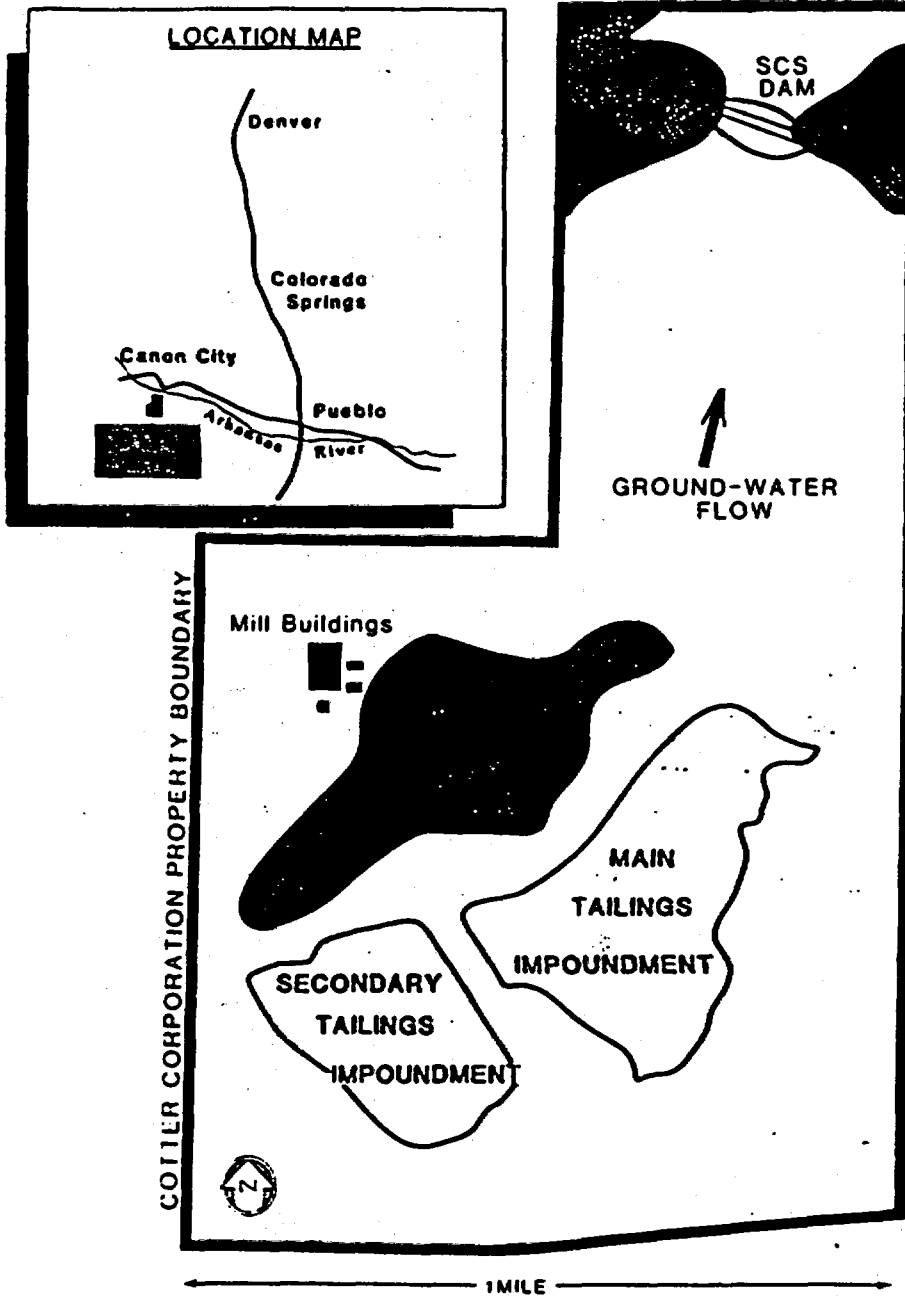
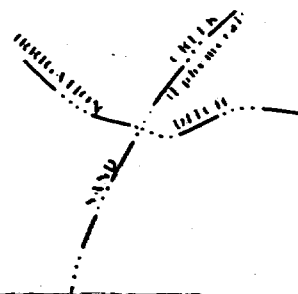
4. Within one hundred twenty (120) days of the completion of the water use survey, Cotter shall submit a written report to the State on the survey results, a plan for information dissemination, and a schedule for water connections, if any.

5. The State shall act upon the water-use survey report, the plan for information dissemination and schedule for any water connections within sixty (60) days of their receipt.

6. Within sixty (60) days of the approval by the State of the information dissemination plan and schedule, Cotter shall implement the plan.

7. Pursuant to the schedule set forth in Paragraph 4 above, Cotter shall, as determined necessary by

LINCOLN PARK



COTTER CORPORATION URANIUM MILL SITE  
Canon City, Colorado

## 14 GROUND WATER COMPLIANCE

### 14.1 Description of Operations and Relevant Environmental Conditions

#### 14.1.1 Objectives

This section describes how attainment of the ground water quality objectives will be determined, and how alternate concentration limits (ACL's) will be established.

#### 14.1.2 Cotter Site Ground Water Protection

The methodology which will be employed includes the use of ground water quality objectives to be measured at two designated monitoring wells in Lincoln Park.

Concentration objectives have been established (see Section 14.1.3) for the two constituents of concern, uranium and molybdenum. These concentration objectives have been determined to be protective of human health, welfare, and the environment. These concentration objectives are predicted to be technically feasible and as low as reasonably achievable.

#### 14.1.3 Lincoln Park Ground Water Quality Objectives

The ground water quality objectives established for uranium and molybdenum at the Lincoln Park Monitoring Well (located pursuant to Paragraph 1 of Section 14.2) are not more than the average concentration of 0.035 mg/liter of uranium and 0.1 mg/liter of molybdenum, calculated using the method described below. The uranium objective is the same as the drinking water recommendation for uranium by the National Academy of Science and the molybdenum objective is the



APPENDIX B

Colorado License No. 369-01S  
Amendment No. 24

December 8, 1987  
Page 1 of 1

Cotter Corporation  
12596 West Bayaud Avenue, Suite 350  
Lakewood, Colorado 80228

Pursuant to the Radiation Control Act, Title 25, Article 11, C.R.S. 1973 as amended, and the State of Colorado "Rules and Regulations Pertaining to Radiation Control," Part III, Amendments 20 and 22 are superseded by this Amendment 24, and

COLORADO RADIOACTIVE MATERIALS LICENSE NO. 369-01S IS AMENDED AS FOLLOWS:

LC 11.35 is added:

11.35 "Cotter Uranium Millsite Remedial Action Plan" (hereafter "RAP") which is attached as Appendix A to the Consent Decree, Order, Judgment and Reference to Special Master filed in the United States District Court for the District of Colorado, Civil Action No. 83-C-2389, "State of Colorado vs. Cotter Corporation, a New Mexico corporation."

LC 9.1.1 is added:

9.1.1 The licensee is hereby authorized and required to store and process its uranium ore, associated mining and milling residues, uranium product concentrate and by-product material consistent with the RAP to which reference is made in LC 11.35.

For the Colorado Department of Health

Date 12/8/87

Signed Warrent. Jacobs

adjusted average daily intake (AADI) value proposed by the U.S. Environmental Protection Agency.

14.1.4 Testing and Analysis

14.1.4.1 Transit Time

1. Temporary cessation of SCS hydrologic barrier operation shall not occur until cessation of operations of each of:

- a. Flushing operations at the Old Tailings Ponds Area;
- b. The SCS Dam to DeWeese Dye Ditch flushing operation.

With respect to the temporary cessation of SCS hydrologic barrier operation described in Paragraph 2 of Section 9.2, the transit time for ground water to flow from behind the SCS Dam to Lincoln Park Monitoring Well shall be determined by the following procedure.

2. Once the SCS hydrologic barrier operations have ceased, a linear regression procedure as described in Section 14.1.4.2 shall be used to determine when there is no longer a significant upward trend in the flux of both uranium and molybdenum at the Lincoln Park Monitoring Well. A measure of flux shall be calculated according to the following procedure or other State approved procedure:

- a. Cotter shall propose locations for two to four piezometers approximately 300 feet apart

APPENDIX C

The four million two hundred thousand dollars (\$4,200,000) to be paid to the State, pursuant to Section XVIII(A), shall be distributed as follows:

A. Two million dollars (\$2,000,000) shall be credited to the "Hazardous Substance Response Fund," established pursuant to Colorado Revised Statutes sec. 25-16-104.6 (1986 Supp.), for reimbursement of past response costs incurred by the State, which sum shall then be credited to the General Fund of the State.

B. One million two hundred thousand dollars (\$1,200,000) shall be credited to the "Hazardous Substance Response Fund," established pursuant to Colorado Revised Statutes sec. 25-16-104.6 (1986 Supp.), which sum shall be used by the State to exercise its rights and obligations under this Consent Decree, including, but not limited to, reviewing Cotter's submissions pursuant to the RAP, overseeing the performance of the Work and retaining the necessary consultants.

C. One million dollars (\$1,000,000) shall be credited to the "CERCLA Recovery Fund," established pursuant to Colorado Revised Statutes sec. 25-16-201 (1986 Supp.), as damages recovered by the State for alleged injuries to natural resources.

and each approximately 300 feet from the <sup>two wells comprising 482</sup> Lincoln Park Monitoring Well, so that the two wells piezometers and the Lincoln Park Monitoring Well form an approximate equilateral triangle. To the extent possible, the piezometers and the Lincoln Park Monitoring Well shall also be located so that water levels in each are not unduly affected by pumpage of nearby wells.

- b. Following approval by the State, Cotter shall drill the piezometers to a depth great enough to penetrate to the Vermejo Formation, so that the depth to the contact between the Vermejo and overlying alluvial deposits is known. The wells shall then be plugged back to the contact. The piezometers shall be constructed using casing slotted throughout the alluvial material, except that the upper 5 feet of each well shall be grouted. Locations of the wells shall be determined by a qualified surveyor, with the elevation of the

measuring point determined to the nearest one-hundredth of a foot.

- c. At the same time that water samples are collected from the Lincoln Park Monitoring Well, Cotter shall also measure depth to water in the Monitoring Well and the two-piezometers. In the Monitoring Well, depth to water shall be measured prior to collecting the sample or purging the well.
- d. The hydraulic gradient at the time of sampling shall be calculated from the hydraulic heads (relative to sea level), and the locations of the three-wells and piezometers.
- e. The average saturated thickness in the vicinity of the Lincoln Park Monitoring Well shall be calculated by averaging the saturated thickness of alluvial materials (estimated by hydraulic head minus elevation of the Vermejo-Alluvial contact) for each of the three-wells and piezometers.
- f. The measures of uranium and molybdenum flux shall be calculated by multiplying the concentration of each by the average

Compliance testing (i.e., comparison to numerical objectives for uranium and molybdenum) shall be performed using the data from each of the two wells comprising the Lincoln Park Monitoring Well separately.

saturated thickness and the magnitude of the hydraulic gradient.

#### 14.1.4.2 Lincoln Park Compliance Testing

The monthly data for the most recent three-year period after the concentrations <sup>measures of flux</sup> begin to increase shall be used in the statistical analysis. When the slopes of both regression lines (time being the independent variable and fluxes of uranium and molybdenum being the dependent variables) are no longer greater than zero (a one-tailed t-test at a 95 percent confidence level), the water from behind the SCS Dam shall be determined to have reached the Lincoln Park Monitoring Well and comparison of water quality against the objectives for uranium and molybdenum shall be performed. Concentrations of these constituents measured in samples collected over the last 24 months of the three year period shall be averaged, and the respective average compared against the numerical objective. In the event that the averages of both molybdenum and uranium are equal to or less than the respective objectives, approval for permanent cessation of Old Tailings Ponds Area flushing and SCS hydrologic barrier operations pursuant to Sections 8.2 and 9.2, respectively, shall be given by the State. In the event that either average is greater than its respective objective, these remedial measures shall be restarted, and the model which formed the basis for granting temporary cessation of

at one of the two wells comprising LPMW

in either well

in both of the two wells comprising

remedial activities shall be corrected. Permanent cessation of the Old Tailings Pond Area flushing and SCS hydrologic barrier operations shall occur when either the ground water quality objectives of Section 14.1.3 are permanently achieved pursuant to the requirements of Paragraph 4.a. of Section 8.2 and Paragraph 3.a. of Section 9.2 respectively, or with respect to the operation of the Old Tailings Ponds Area flushing the reasonable technological limits are met as described in Paragraph 4.b. of Section 8.2 and with respect to the operation of the SCS hydrologic barrier the requirements of Paragraph 3.b. of Section 9.2 are satisfied.

14.1.5 40 C.F.R. 192, Subpart D Compliance

The RAP described in this document is designed to achieve applicable ground water protection requirements of 40 C.F.R. 192, Subpart D, as it incorporates and modifies specific sections of 40 C.F.R. 264, Subpart F.

Notwithstanding any other provision of this RAP, Cotter shall comply with 40 C.F.R. Part 192, Subpart D, as it incorporates and modifies specific sections of 40 C.F.R. Part 264, Subpart F, as described in this Section 14 and comply with Section 121, including, but not limited to, Section 121(d)(2)(B)(ii) of CERCLA.

At the Cotter site, these requirements are described below:

1. The ground water protection standard is as set forth in 40 C.F.R. 192.32 (a)(2) as it incorporates and modifies 40 C.F.R. 264.92.

2. The list of hazardous constituents is established in 40 C.F.R. 192.32 (a)(2)(i) which incorporates and modifies 40 C.F.R. 264.93. 40 C.F.R. 192.32 (a)(2)(i) adds uranium and molybdenum to the list of hazardous constituents identified in Appendix VIII of 40 C.F.R. Part 261.

3. The concentration limits are provided in 40 C.F.R. 192.32 (a)(2)(ii) as it incorporates and modifies 40 C.F.R. 264.94. Table A of 40 C.F.R. 192, Subpart D, adds concentration limits for combined radium-226 and -228 (5 pCi/l) and gross alpha-particle activity (excluding radon and uranium) (15 pCi/l) to the concentration limits established in 40 C.F.R. 264.94, Table 1. The concentration of a hazardous constituent:

- a. Must not exceed the background level of that constituent in the ground water at the time that limit is specified; or
- b. For any of the constituents listed in Table 1 of 40 C.F.R. 264.94 must not exceed the respective value given in that Table if the background level of



the constituent is below the value given in Table 1; or

- c. Must not exceed an alternate limit established by the State under item 7 below.

4. The point of compliance is as set forth in 40 C.F.R. 264.95. Specifically, at the Cotter site the compliance points shall be monitoring wells located in the uppermost aquifer which is contained in the Quaternary Terrace Deposits and the Poison Canyon Formation. The compliance point wells shall be located along a vertical surface hydraulically downgradient of the main impoundment near the toe of the impoundment and along the downgradient boundary of the Old Tailings Ponds Area. The wells shall be located in the area shown on Figure 14-1. The distribution of these wells shall be proposed by Cotter. Their open interval shall not exceed 30 feet in length and the vertical distribution of monitored zones shall extend from the water table to the unweathered surface of the Poison Canyon formation. These wells shall be of a design, construction, and specific location approved by the State.

5. The compliance period is the period of time during which the compliance standard applies. The compliance period is as set forth in 40 C.F.R. 264.96.

6. The ground water compliance monitoring program is described in 40 C.F.R. 264.99 and 40 C.F.R. 264.100 (d).

7. The process for setting alternative concentration limits to be applied at compliance points is as set forth in 40 C.F.R. 192.32(a)(2)(v) which incorporates 40 C.F.R. 264.94(b) and (c), and as set forth in Section 121 of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA).

a. In establishing ACL's the following factors will be considered:

i. Potential adverse effects on ground water quality, considering:

a) The physical and chemical characteristics of the waste in the regulated unit, including its potential for migration;

b) The hydrogeological characteristics of the facility and surrounding land;

c) The quantity of ground water and the direction of ground water flow;

- d) The proximity and withdrawal rates of ground water users;
  - e) The current and future uses of ground water in the area;
  - f) The existing quality of ground water, including other sources of contamination and their cumulative impact on the ground water quality;
  - g) The potential for health risks caused by human exposure to waste constituents;
  - h) The potential damage to wildlife, crops, vegetation, and physical structures caused by exposure to waste constituents;
  - i) The persistence and permanence of the potential adverse effects; and
- ii. Potential adverse effects on hydraulically connected surface water quality, considering:
- a) The volume and physical and chemical characteristics of the waste in the regulated unit;

- b) The hydrogeological characteristics of the facility and surrounding land;
- c) The quantity and quality of ground water and the direction of the ground water flow;
- d) The patterns of rainfall in the region;
- e) The proximity of the regulated unit to surface waters;
- f) The current and future uses of surface waters in the area and any water quality standards established for those surface waters;
- g) The existing quality of surface water, including other sources of contamination and cumulative impact on surface water quality;
- h) The potential for health risks caused by human exposure to waste constituents;
- i) The potential damage to wildlife, crops, vegetation and

physical structures caused by  
exposure to waste constituents;  
and

j) The persistence and permanence  
of the potential adverse effects.

b. An ACL shall be established through  
either:

i. Considering the foregoing issues  
(a.i.(a-i)) and (a.ii.(a-j)) and  
the requirements of Section 121 of  
CERCLA, as amended by SARA, an ACL  
will be set at each compliance  
point monitoring well, as  
necessary, when the Lincoln Park  
Monitoring Well ground water  
quality objectives as set forth in  
Section 14.1.3 have been achieved,  
and operation of the withdrawal  
well system has ceased pursuant to  
Paragraph 4 of Section 4.2. The  
ACL for each compliance point well  
shall be the constituent  
concentration in that compliance  
point well as measured quarterly  
over a two year period; or

ii. Considering the foregoing issues (a.i.(a-i)) and a.ii.(a-j)) and the requirements of Section 121 of CERCLA, as amended by SARA, an ACL will be set at each compliance point well, as necessary, when the State approves Cotter's application demonstrating that the reasonable technological limits of the remedial activities have been reached pursuant to Paragraph 4.b. of Section 8.2, and operations of the withdrawal well system has ceased pursuant to Paragraph 4 of Section 4.2. The ACL for each compliance point well shall be the constituent concentration in that compliance point well as measured quarterly over a two year period.

8. The corrective action program required by 40 C.F.R. 192.33 as it incorporates 40 C.F.R. 264.100 for the Cotter site is as set forth in the RAP, until the completion of RAP ground water remedial activities. If an exceedance of concentration limits occurs after RAP ground water remedial

activities are completed, a corrective action program pursuant to 40 C.F.R. 192.33 shall be implemented.

#### 14.2 Remedial Activities

The purpose of the remedial activities is to establish the Lincoln Park Monitoring Well, to establish the 40 C.F.R. 192 Compliance Point Wells, and to assess the effectiveness of the remedial ground water actions described in Sections 4 through 13.

Cotter shall perform the following remedial activities:

1. Cotter shall propose either ~~one~~ <sup>or one existing well</sup> ~~two~~ <sup>and one new well within</sup> (2) ~~the same~~ <sup>area</sup> existing wells within the southwest one-quarter (SW 1/4) of the southwest one-quarter (SW 1/4) of Section three (3) or two (2) new wells within the same area, to be the Lincoln Park Monitoring Well. The new wells shall be constructed to Class A well specifications. The monitoring wells shall be located downgradient from the DeWeese Dye Ditch in or near the Sand Creek channel, and completed between depths of the estimated water table at its highest, and 40 feet below the estimated water table at its highest, and shall be capable of being pumped at 10 gpm for one hour, prior to installation of the permanent pump.

Cotter shall implement a plan for maintenance and monitoring of the wells. If new wells are drilled to be the Lincoln Park Monitoring Well, Cotter shall collect monthly

water samples from the monitoring wells. Each sample shall be analyzed for the concentrations of uranium and molybdenum. ~~Following two (2) years of acceptable monitoring, the State shall select one (1) of the two (2) monitoring wells as the Lincoln Park Monitoring Well. The well not selected shall be grouted closed. Once the Lincoln Park Monitoring Well is approved by the State, Cotter shall collect water samples monthly for analysis and maintain the wells until remedial activities have been completed at the site pursuant to this RAP. Together, these wells shall be designated, and collectively referred to herein, as the "Lincoln Park Monitoring Well."~~

2. Cotter shall install compliance monitoring wells in the area described in Section 14.1.5, item 4 above. These wells shall be constructed to Class A well specifications (see Section 3.2.1) and the construction requirements of 40 C.F.R. 264.97(c).

Well(s) shall also be installed or existing wells designated which will satisfy the requirements of background monitoring set forth in 40 C.F.R. 264.97(a) (1) and (g) (2).

#### 14.3 Requisite Assessments and Submittals

Cotter shall prepare and submit to the State for review and approval the following:

1. A proposal for an existing monitoring wells and/or new monitoring wells to be the Lincoln Park Monitoring Well, which shall include:



- a. The location of the well(s);
- b. The well completion data of an-existing wells if use of an-existing wells isare proposed;
- c. The design drawings and construction specifications for new wells;
- d. QA/QC Plan;
- e. A plan for monitoring and maintenance.

2. A written final construction report for new

wells, which shall include:

- a. As-built drawings;
- b. Explanation of and response to unexpected conditions and problems;
- c. Summary of construction and quality assurance evaluations;

3. As a part of the RAP Annual Report specified in Section 3.1, a written annual summary of the analysis of the water samples and the annual average of the analysis of the water samples.

4. A plan for the on-site 40 C.F.R. 192 compliance point wells, which shall include:

- a. The location of the wells;
- b. The well completion data of an existing well if an existing well is proposed;
- c. The design drawings and construction specifications for new well(s); and

- d. The list of constituents to be measured in those wells in accordance with 40 C.F.R. 264.99.
- e. Identification of the background well(s) as required by 40 C.F.R. 264.97.

**14.4 Schedule**

Cotter shall design and conduct these remedial activities according to the following schedule:

1. Within sixty (60) days following the entry of a Consent Decree by the Court, Cotter shall submit a plan for the proposed Lincoln Park Monitoring Well(s).
2. The State shall act upon the proposal within sixty (60) days of its receipt.
3. Cotter shall start and complete construction of a new well within one hundred and eighty (180) days of the approval by the State of the proposal.
4. Cotter shall submit a final construction report to the State within one hundred twenty (120) days after the completion of new wells.
5. The State shall act upon the final construction report for new wells within one hundred twenty (120) days of its receipt.
6. As a part of the RAP Annual Report required pursuant to Section 3.1, Cotter shall submit to the State a

written annual summary of the analysis of water samples and the annual average of the analysis of the water samples.

~~7. The State shall select the Lincoln Park Monitoring Well from the well(s) proposed pursuant to Paragraph 1 of Section 14.2 within ninety (90) days after the receipt of two (2) years of monitoring data.~~

87. Cotter shall submit a proposed plan, including location, an installation schedule, and a QA/QC Plan for the compliance monitoring wells required pursuant to Paragraph 4 of Section 14.3 to the State within one hundred twenty (120) days of the completion of Old Tailings Ponds Area soil removal pursuant to Paragraph 3.a. of Section 8.2.

98. The State shall act upon the plan within sixty (60) days of its receipt.

109. Cotter shall implement the approved plan and start compliance monitoring as soon as possible pursuant to the approved schedule set forth therein and in any event within one (1) year of completion of Old Tailings Ponds Area soil removal as provided in Paragraph 8 of Section 14.4.

110. The State shall act upon the proposal within sixty (60) days of its receipt.

## 32 HEALTH RISK ASSESSMENT

### 32.1 Description of Operations and Observed Impacts

Mill derived constituents are released into the environment, and are present in the ground water, air and soils. There are potential routes of exposure from the environment to humans. The present data are insufficient to determine if there is an effect on human health.

### 32.2 Remedial Activities

The purpose of these remedial activities is to determine if the release of mill derived constituents has an effect on human health.

Cotter shall perform and the State shall be given the opportunity to participate, as specified below, in the following remedial activities:

1. Cotter shall have a health assessment panel comprised of at least three (3) qualified and independent persons with expertise in medicine, toxicology, epidemiology, public health, or human health effects associated with exposure to radionuclides and metals to design and conduct a comprehensive study to assess the human health risks and impacts, if any, attributable to mill derived constituents.

The geographic boundaries shall include the off-site area in the vicinity of the mill site, including Lincoln Park and Canon City. The study shall include:

a. An assessment of human health risks and impacts associated with:

- i. Consumption of impacted ground water;
- ii. Consumption of impacted surface water;
- iii. Exposure to impacted soils and sediments;
- iv. Inhalation of radon gas or impacted airborne dust;
- v. Consumption of fish from impacted surface water bodies;
- vi. Consumption of fruits and vegetables irrigated with impacted water;
- vii. Consumption of milk from cows that have consumed impacted water;
- viii. Consumption of meat from livestock that have consumed impacted water or feed.

b. A multi-dimensional risk assessment matrix using an estimate of human health risk, considering, as appropriate, sensitive segments of the population, as the dependent variable, and using hazard

potential and mechanism of exposure as the independent variable;

- c. Phases for problem definition, design of methodology, completion of sampling and methodology, generation of written report and recommendations for future action;
- d. The review and integration of appropriate information, obtained as a result of the remedial activities conducted as described in this RAP.
- e. Sampling.

32.3

Requisite Assessments and Engineering Activities

Cotter shall prepare, or for Paragraphs 2 and 3 have prepared by the Health Risk Assessment Panel, and submit to the State for review and approval the following:

1. A written proposal identifying the persons who will design and conduct the health risk assessment, which shall include:

- a. Identity of each person;
- b. Curriculum vitae of each person;
- c. Experience in the design and conduct of health risk assessment;
- d. All relevant past experience;

2. A plan for the design and implementation of a study to assess the human health risks and impacts, which shall include:

- a. Description of activities and goals;
- b. Description of procedures and methodologies, including the proposed name of a volunteer local community representative who will act as an <sup>liaison</sup> interface between the panel and the community for the purposes of information exchange between these two groups. (The minimum qualifications of this volunteer local community representative are: resident in the area for no less than three (3) years and medical doctor or Ph.D. in a physical science);
- c. Consideration and integration of appropriate information, as determined by the panel, generated as a result of the remedial activities being conducted pursuant to this RAP and any relevant reports or findings prepared by the Agency for Toxic Substances and Disease Registry (ATSDR).
- d. QA/QC Plan;

e. Schedule.

3. A written interim report on the study to assess human health risks and impacts, which shall include:

- a. Description of activities and results;
- b. Recommendations for future action, considering ATSDR's recommendation;
- c. Quality assurance and quality control evaluation;
- d. Explanation of and response to unexpected conditions and problems.

4. A written report stating findings and conclusions of the Health Risk Assessment Panel regarding any site-related reports submitted to the panel by Cotter, the State or the ATSDR, including reports of the ground water survey (see Section 13), Lincoln Park soil survey (see Section 25), Willow Lakes study (see Section 26), and the Arkansas River (see Section 30).

5. A written final report of the results of the study to assess human health risks and impacts, which shall include:

- a. Description of activities and results;
- b. Recommendations for future action, considering ATSDR's recommendation;
- c. Quality assurance and quality control evaluation;



- d. Explanation of and response to unexpected conditions and problems.

32.4 Schedule

Cotter shall conduct these remedial activities according to the following schedule:

1. Within sixty (60) days of the entry of the Consent Decree by the Court, Cotter shall submit a written proposal identifying the persons who will design and conduct the health risk assessment.

2. The State shall act upon the written proposal within thirty (30) days after its receipt.

3. Within one hundred and twenty (120) days after approval of the written proposal, Cotter shall have the health assessment panel prepare and Cotter shall submit a plan for the design and implementation of a study to assess human health risks and impacts, if any.

4. The State shall act upon the plan within ninety (90) days after its receipt.

5. Within one hundred and eighty (180) days of the approval of the plan, Cotter shall have the Health Risk Assessment Panel implement the plan and submit a written interim report.

6. The State shall act upon the interim report within thirty (30) days of receipt.

7. Within one hundred and twenty (120) days of receipt of any reports submitted to the Health Risk Assessment Panel, Cotter shall have the Health Risk Assessment Panel submit a written report pursuant to Paragraph 4 of Section 32.3 to the State.

8. The State shall act on the reports within thirty (30) days of receipt.

9. Within one hundred and eighty (180) days after the completion of the assessments, Cotter shall have the Health Risk Assessment Panel prepare the final written report, and Cotter shall submit it to the State.

10. The State shall act upon the final written report within one hundred twenty (120) days of its receipt.

IN THE UNITED STATES DISTRICT COURT  
FOR THE DISTRICT OF COLORADO

Civil Action No. 83-C-2389

STATE OF COLORADO,

Plaintiff,

vs.

COTTER CORPORATION, a New Mexico corporation,

Defendant.

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CONSENT DECREE COMMENTS AND PLAINTIFF STATE OF COLORADO'S  
RESPONSE SUMMARY

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Plaintiff State of Colorado by and through the Office of the Attorney General hereby submits all public comments on the Consent Decree and provides the following responses to these comments.

INTRODUCTION

This Response Summary provides the State of Colorado's ("state") responses to comments submitted by the U.S. Environmental Protection Agency ("EPA") (attached as Exhibit 23 (technical comments), Exhibit 68 (nontechnical comments) and Exhibit 69 (clarification of nontechnical comments) and incorporated by reference) and the response of the state to comments submitted by

the general public (attached as Exhibits 1-22 and 24-67 and incorporated by reference) during the public comment period which followed the lodging of the Consent Decree, Order, Judgment and Reference to Special Master with the court on December 11, 1987. Also included, as Exhibit 70, is the transcript of the public meeting conducted by the state in Canon City, Colorado, on January 5, 1988. The public meeting was held pursuant to the requirements of section 117 of the Comprehensive Environmental Response, Compensation and Liability Act, as amended by the Superfund Amendments and Reauthorization Act of 1986 ("CERCLA"). All public comments and the public hearing transcript are enclosed and marked as Attachment B.

I. EPA COMMENTS ABOUT THE CONSENT DECREE  
AND THE REMEDIAL ACTION PLAN AND THE  
STATE'S RESPONSES TO EPA'S COMMENTS.

A. EPA's role in settlement negotiations.

The role of EPA in the settlement negotiations conducted in the instant case has been framed by the Memorandum of Agreement ("MOA") entered into by and between the state and EPA on April 2, 1986. A copy of the MOA is enclosed as Attachment A. Pursuant to the MOA and consistent with the National Contingency Plan ("NCP"), the state was designated to act as the lead agency at the Lincoln Park site for purposes of the NCP and CERCLA. The site near Canon City is listed on the National Priorities List

("NPL"). The goal of the litigation between the state and Cotter has been to select and implement a remedy on and in the vicinity of the Cotter milling property, including the Lincoln Park site (hereinafter referred to as the "Cotter Facility") which is and shall be consistent with CERCLA and the NCP. Pursuant to the MOA, EPA was to act in a consultative role and to provide technical support and policy guidance with respect to CERCLA and NCP compliance. EPA is not a party to this litigation.

The state has, consistent with its obligations under the MOA, advised EPA of settlement negotiations in this action, has consulted with EPA concerning settlement and the Remedial Action Plan ("RAP") and has on many occasions provided EPA an opportunity to review drafts of the Consent Decree and RAP (hereinafter referred to collectively as the "Settlement"). In addition, during the course of settlement negotiations, the state met with and had telephone conversations with EPA on several occasions to consult with it regarding NCP and CERCLA consistency. On these occasions, EPA did identify its concerns with the proposed settlement to the State. But, EPA did not advise the state that any aspect of the proposed settlement was inconsistent with the NCP or CERCLA.

B. EPA's written comments and the state's responses to those comments.

In addition to its consultative role pursuant to the MOA, EPA had an opportunity to submit written comments to the state during the public comment period. EPA improperly submitted written comments directly to the court, rather than to the state, on January 15, 1988, based on its technical review of the Settlement. In its correspondence with the court, EPA requested an extension of time to January 29, 1988, to provide comments based on a nontechnical review of the Settlement. EPA's nontechnical comments were again improperly transmitted directly to the court on January 29, 1988. EPA's nontechnical comments were received by the state on February 1, 1988. Based on conversations and a meeting between EPA, the state and Cotter, EPA submitted additional comments to the state on February 12 to clarify EPA's nontechnical comments. EPA's comments are summarized and the state's responses to those comments are provided in this section I.

1. Compliance with CERCLA and the National Contingency Plan.

EPA comments that it cannot, at this time, make a determination that the Settlement meets the criteria of CERCLA section 121, 42 U.S.C. sec. 9621 (1986) and is consistent with the NCP.

At the Cotter Facility, to resolve the litigation between the state and Cotter, the state is acting as lead agency by designation from EPA and pursuant to NCP sections 300.61(e)(1), 300.62(e)(2), 300.68 and 300.71. The state has made a determination that the remedy embodied by the Settlement is consistent with CERCLA and the NCP. The State of Colorado has regulated the Cotter Facility for nineteen (19) years. Colorado negotiated the Settlement with Cotter over a 2-year period. The state is more familiar with the operation and effect of the Settlement than is EPA. Colorado will be the regulatory entity to ensure that the remedy, as implemented, meets the requirements of the Settlement. To resolve the litigation between the state and Cotter, the state has determined that the remedy embodied by the Settlement does establish the appropriate extent of remedy for the Cotter Facility and does meet all CERCLA and NCP requirements.

A demonstration of consistency with the NCP's site investigation, remedial investigation, screening and evaluation of alternatives and remedy selection requirements was included in the Remedial Investigation ("RI") and Feasibility Study ("FS") reports, which were distributed for public comment. The Settlement need not and does not reiterate that demonstration of consistency. The parties complied with the NCP, particularly sections 300.67, 300.68, and 300.71, 40 C.F.R. secs. 300.67, 300.68 and 300.71 (1987), in developing the Settlement.

After the remedy has been implemented and completed, EPA must make its own determination as to whether Lincoln Park can be delisted from the NPL. Neither the MOA nor EPA's advice and comments created a relationship of agency between EPA and the state. EPA expressly reserved its rights under CERCLA or any other statutory provision or common law with regard to the Lincoln Park site. Attachment A, para. 11 at pp. 6-7.

More specific comments made by EPA concerning the Settlement's compliance with CERCLA and the NCP are set out and responded to below.

a. EPA commented that it is not constrained by the Consent Decree from exercising its delegated authority under section 106 of CERCLA to respond to an imminent and substantial endangerment which may become present at Lincoln Park. The state agrees. EPA is not a party to this suit. Moreover, the state entered into an agreement with EPA expressly preserving any authority EPA has at the Lincoln Park site. See Attachment A, para. 11 at pp. 6-7. Moreover, it should be noted that the Consent Decree in no way diminishes or modifies Cotter's obligation to follow all applicable federal, state and local laws. See 42 U.S.C. sec. 9652(d) (1986).

b. EPA commented that the state lacks the legal authority under CERCLA to take actions to abate a threat to its public health or to the environment and to order Cotter to under-



take remedial action at the Lincoln Park site. EPA's analysis is not correct. The State of Colorado has many authorities by which it may abate any threat to public health or the environment posed by Cotter's activities, enforce the Settlement and compel Cotter compliance. First, it should be noted that the state has clear authority to obtain injunctive relief under the common law. New York v. Shore Realty Corp., 759 F.2d 1032, 1050-1051 (2d Cir. 1985). The state also has statutory authority, under CERCLA and state statutes, to compel Cotter compliance. See Oberst v. Mays, 365 P.2d 902, 905 (Colo. 1961) (ordering summary abatement of nuisance). CERCLA section 302(d), 42 U.S.C. sec. 9652(d), expressly preserves the operation of state law, including common law, at CERCLA sites.

By its enactment of SARA, Congress broadened the states' authority under CERCLA. The states may now obtain injunctive relief from the United States District Courts. Section 121(e)(2) added to CERCLA by SARA provides in pertinent part:

A State may enforce any Federal or State standard, requirement, criteria or limitation to which the remedial action is required to conform under this chapter in the United States District Court for the district in which the facility is located.

42 U.S.C. sec. 9621(e)(2) (1986). The statute does not limit the relief available to the state to enforce such standards, requirements, criteria or limitations. As this court has previously recognized, an effective means of enforcing such standards is for

the court to enter appropriate injunctive relief compelling compliance by responsible parties with the remedy approved by the court, i.e., the one embodied in the Settlement. See May 19, 1987 Hearing Transcript at 1665, ll. 20-22, Colorado v. Idarado Mining Co., et al., Case No. 83-C-2385 (D. Colo.) (Order denying Defendants' Motion to Dismiss Plaintiff's Claims for Injunctive and Declaratory Relief to Enforce or Approve its Remedial Action Plan).

Additionally, it should be noted that the Settlement is a legally binding document in which Cotter has contracted to perform all remedial activities. Specific provisions of the Consent Decree provide the state and this court with ample means to force Cotter's compliance if the need arises (for example, stipulated penalties).

c. EPA commented that the state's site investigation is inconsistent with the NCP because it did not include an endangerment assessment or an analysis of applicable or relevant and appropriate requirements ("ARARs"). EPA subsequently clarified that it cannot, at this time, determine whether the Remedy is consistent with the NCP. The state's site investigation met the requirements of the NCP. NCP section 300.68(d) requires an investigation, including sampling, monitoring, and an exposure assessment, as necessary to determine the nature and extent of the threat presented by the release of hazardous substances from

the Cotter Facility. The state did conduct the necessary investigation, including an endangerment or exposure assessment which is incorporated in its RI, chapter 8. The state also performed an ARAR analysis and the state's final ARAR analysis is found in the Consent Decree, section XXIV.

d. EPA commented that the state cannot be a lead agency for purposes of CERCLA and the NCP. Again, EPA's interpretation is too narrow. EPA and the state entered into an MOA in 1986 regarding the Lincoln Park site whereby EPA recognized and agreed that the "State is acting as lead agency at [Lincoln Park]. EPA recognizes that the state will perform the functions for lead agencies specified in the NCP at [Lincoln Park]." Attachment A at p. 3, para. 1. Moreover, the NCP recognizes that, depending on the circumstances, several entities, federal or state, may have the authority to respond, pursuant to CERCLA, to releases or threatened releases of hazardous substances at a particular site. For example, at a site listed on the NPL, the federal government or a state may take the response action. To coordinate response actions in such cases, the NCP developed the concept of a "lead agency." Under the NCP, a "lead agency" is the "Federal agency or State agency operating pursuant to a contract or cooperative agreement executed pursuant to sec. 104(d)(1) of CERCLA that has primary responsibility for coordinating response action under this plan." 40 C.F.R. sec. 300.6 (1985). Under the

NCP, the "lead agency" acts for the President under CERCLA with regard to selection and enforcement of response actions. At the Cotter Facility, the state believes it is the lead agency "operating pursuant to a contract," the MOA.

In addition, at a site such as the Cotter Facility where no "Superfund" money is being used for the remedy, a state may take the response action as a lead agency, even in the absence of a cooperative agreement with EPA. The NCP delineates two categories of CERCLA response actions: "fund-financed actions" (40 C.F.R. secs. 300.61(e) and 300.62(a)(2) (1987)), i.e., actions financed from the federally-maintained "Superfund"; and "non fund-financed" response actions (40 C.F.R. sec. 300.71 (1987)). States may act as the lead agency for both fund-financed and non fund-financed response actions. NCP section 300.62(a)(2) provides: "Cooperative agreements or State Superfund contracts are unnecessary for response actions that are not Fund-financed, including any State or other party actions...." NCP section 300.61(e)(1) confirms that a state need not enter into a cooperative agreement before taking non-fund-financed enforcement action:

[T]his subpart [of the NCP dealing with Hazardous Substance Response] does not establish any precondition to enforcement actions by either the Federal or State governments to compel response actions by responsible parties.

Based on the foregoing interpretation of the NCP, which has been adopted by this court (see April 2, 1987 Hearing Transcript at 27, ll. 22-24, Colorado v. Idarado Mining Co., et al., Case No. 83-C-2385 (D. Colo.)), the State of Colorado can act as lead agency at the Cotter Facility and is, therefore, authorized to determine "the appropriate extent of remedy" for purposes of the Settlement, resolving the litigation between the state and Cotter. 40 C.F.R. sec. 300.68(i)(1).

EPA's implication that the court has no authority to determine the appropriate extent of remedy, because that authority "resides with EPA" (Exhibit 68 at 3) overlooks CERCLA section 113(b), 42 U.S.C. sec. 9613(b), which provides "the United States district court shall have exclusive original jurisdiction over all controversies arising under this chapter." The chapter reference is to the entirety of CERCLA, including all issues arising under CERCLA sec. 107(a)(1-4)(A), (C) and (D), as presented in this case.

e. EPA commented that public access to technical documents and future remedial planning is not contemplated in the RAP as required by the NCP. The state responds that in the case of any modification to the Consent Decree, section XXIII states,

No amendment to this Consent Decree shall be granted unless such amendment is reasonably necessary to effectuate the purposes of the negotiated settlement; or to protect the public health, welfare, or environment;

or unless performance of any requirement of this Consent Decree has been rendered impossible by any subsequently enacted, modified or promulgated federal, state or local statute, regulation, ordinance or permit. Any proposed amendment to this Consent Decree determined by the state to be major shall be submitted for the appropriate public comment prior to its entry as an order of the Court.

(Emphasis added.) Throughout these proceedings, the state has operated under its Community Relations Plan, consistent with NCP section 300.67. The state will encourage continued public participation as the remedy is implemented by continuing to comply with NCP section 300.67 and EPA policy. (See Superfund Remedial Design and Remedial Action Guidance; OSWER Directive 9355.0-4A; June 1986, pp. 2-26.) In addition, the Colorado Department of Health ("CDH") is statutorily required, with certain exceptions, to keep these records open for public inspection.

f. EPA commented that the criteria for approval are not described in the RAP. The state notes that the RAP includes objectives and construction and performance standards. The state will also review all submittals to insure that the conditions of the RAP are complied with. Pursuant to the Consent Decree, failure of a particular remedial activity to meet its objective does not relieve Cotter of the responsibility to meet the objective.

g. EPA stated a health assessment and endangerment assessment is required. It further recommended that the Agency

for Toxic Substances and Disease Registry ("ATSDR") should conduct a health assessment at the Cotter Facility and indicated its opinion that the work that has been done does not meet NCP requirements. ATSDR was asked by the state to evaluate the site and the site was put on the ATSDR list to be evaluated. It is, however, inappropriate to postpone indefinitely an effective remedy at this site until ATSDR can perform its evaluation. Colorado conducted an endangerment assessment prior to remedy selection, consistent with NCP section 300.68. The results of the endangerment assessment were compiled and reported to the public in the RI, chapter 8. The state has determined that the endangerment assessment meets the requirements of NCP sections 300.64(a), 300.66(a) and 300.68(d), (e) and (j). Additional health assessment work will be conducted as part of the Settlement. The Consent Decree provides that, if a health endangerment is identified in the future, Cotter will be required to take appropriate action. It must also be noted that the cleanup standards used in the RAP are equal to or cleaner than standards established by federal and state agencies, unless established standards cannot be reached using available technologies.

h. EPA commented that documentation in the RAP is inadequate to evaluate the effectiveness of the remedy. The state responds that the RAP is based on data and facts, which are contained in and documented by the RI and FS.

i. One EPA commentor suggested that further studies should be conducted and that final design specifications should be stated in several sections of the RAP. The state notes that, pursuant to EPA guidance, specific designs are not generally included in a RAP. EPA guidance states "following selection of a remedy... action must be taken to initiate design activities" (emphasis added). (Superfund Remedial Design and Remedial Action Guidance; OSWER Directive 9355.0-4A, June 1986, pp. 2-5. Also see EPA's Record of Decision/Enforcement Decision Document Guidance; January 17, 1986; pp. 0-14.)

j. EPA doubted that, were it enforcing the remedy, it would approve cessation of the flushing program when either the Lincoln Park ground water objectives are met or the technological limits of the flushing program are met. The state responds first, that EPA would authorize a less protective contaminant concentration limit (i.e., a higher level of ground water contamination) for the Lincoln Park area. Second, to stop flushing when the limits of that technology have been reached (i.e., when no further remediation can be achieved by the technology) is consistent with cost-effectiveness criteria in NCP section 300.68(j)(1). Third, RAP section 14 provides that the on-site compliance points must meet applicable health and environmental criteria of 40 C.F.R. sec. 264 (1987) and of CERCLA.

k. EPA felt that the statement that the RAP has



been developed to effectively mitigate any impacts to health, welfare, and the environment attributable to the mill facility is misleading. The state responds that prior to developing this RAP, and prior to preparing the FS, the state conducted an environmental assessment, evaluated federal and state ground water standards, and United States soil standards as well as those promulgated by other countries. The remedy selected is designed to meet all applicable health and environmental protection standards. Therefore, if properly implemented, it will be protective of human health, welfare and the environment. The state, through the Settlement and applicable laws, can ensure that the remedy is properly implemented. Moreover, the Settlement permits further remediation if new scientific information becomes available that would dictate further cleanup for adequate health and/or environmental protection. Moreover, pursuant to CERCLA section 121(c), the remedy will be reevaluated every 5 years to determine whether additional cleanup is required.

1. EPA comments that the RAP does not specify where and how alternative concentration limits ("ACL's") are to be met. Apparently, EPA overlooked RAP sections 14.1.5.1 through 14.1.5.7 which address the ground water protection standard, the list of hazardous constituents, the concentration limits, the point of compliance, the compliance period, the ground water compliance monitoring program, and the setting of ACL's.

m. EPA specifically identified several problems with the ACL setting approach used in the RAP: (i) it does not address all of the contaminants of concern, only molybdenum and uranium; (ii) it does not consider the recently set standards for uranium and molybdenum in ground water at inactive uranium processing sites, which are relevant and appropriate, and after closure will be applicable; and (iii) EPA should have a concurrence role. Again, EPA has misunderstood the RAP. The state responds as follows to each objection. First, the ACL setting process includes the complete list of hazardous constituents utilized by EPA and adds uranium and molybdenum (see RAP section 14.1.5.2). Second, though the "standards" are only proposed, when adopted they would be applicable at the Cotter Facility. In the event it is technically infeasible to obtain this level of clean-up on-site at the proposed points of compliance, the Settlement provides, consistent with 40 C.F.R. sec. 192.32(a)(2)(v) (1987), (incorporating 40 C.F.R. sec. 264.94(b) and (c) (1987)) and CERCLA section 121(d)(2)(B)(ii), that ACL's will be set. Third, Colorado has the authority to set ACL's. Consistent with the MOA the state will continue to consult with EPA as the remedy is implemented at the Cotter Facility.

## 2. Background and cleanup standards.

EPA expressed concerns about the background values, cleanup

standards and standard setting procedures established by the Settlement. The following discussion summarizes those comments and provides the parties' responses.

a. EPA was concerned that background values for soils not be established by sampling in contaminated areas. Thus, it suggested that background soil data be obtained from undeveloped, unmined areas. The state agrees. RAP section 3.2.4 identifies important background area features. The background data set is designed to estimate conditions which existed on the Cotter site before construction began. Areas exhibiting anthropogenic contamination will not be used to establish background values.

b. EPA suggests that data from the existing air monitoring system should be used to locate areas in which background sampling will be conducted. The state responds that air monitoring data from areas that otherwise meet the criteria in RAP section 3.2.4 will be considered in the selection of background sampling sites.

c. EPA believes that the time allotted for the background sampling program should be limited to 1 year rather than 2. The state responds that the schedule set out in the RAP was carefully considered and is appropriate. The RAP provides up to 7 months for submittal and approval of the background sampling plan. The "wet sediment sampling" program is intended to collect

data on the transport of contaminated sediments in normally dry streams. The frequency of storms of adequate intensity to initiate transport cannot be accurately predicted. Therefore, 17 months for sample collection, analysis and report preparation is reasonable. Moreover, the primary use of background values will be in connection with sediment remediation which is tied to the closure of the facility, which is scheduled to occur in approximately 20 years.

d. EPA believes that the statistical method used to determine background range is inappropriate and has suggested that an alternative statistical method be proposed. The state responds that it has evaluated the background data obtained from other projects and subjected those data to a similar statistical test. These analyses indicate that use of the proposed statistical method at this site will result in remediation of soils to levels at or below applicable or relevant and appropriate requirements ("ARARs").

e. EPA commented about the absence of standards in several RAP sections. Apparently, EPA misunderstood the RAP, since each RAP section contains appropriate standards. For example, EPA commented about the lack of standards for: on-site soils remediation (but see RAP sections 21.3.c and 21.3.d); air emissions (airborne standards are set by the Radiation Control Act and remediation is established in RAP sections 16 through

29); main and secondary impoundment performance (but see RAP section 4.2.2 requiring that gradient be maintained toward withdrawal wells); and pathway management (but see RAP section 29.2.1 requiring remediation of any areas exceeding background range).

f. EPA is of the opinion that the Lincoln Park ground water quality objectives should conform to Table A values for uranium and molybdenum "adopted by the EPA in 52 Fed. Reg. 36000, September 24, 1987." The state answers that the referenced Federal Register only proposed standards; those standards are not yet final. Moreover, the Lincoln Park ground water quality value for molybdenum is the same as that proposed by EPA. The EPA proposal for uranium (0.044 mg/l) is higher than the criteria in the RAP (0.035 mg/l). Because the intent of CERCLA is to remediate to below standards when practicable, the state does not feel it necessary to permit increased amounts of contamination in the Lincoln Park ground water.

g. EPA also suggested that on-site soils remediation should be done pursuant to applicable, relevant or appropriate requirements of RCRA and SMCRA. Again, EPA was concerned that no standards had been identified. Both RCRA and the Radiation Control Act have been identified to contain ARARs with which the facility cleanup must comply.

### 3. Sampling and monitoring.

EPA made several comments to the effect that an extensive suite of analytes should have been sampled for in various media. Other comments address sampling or monitoring methods, location or rationale. EPA's comments are summarized and the state's responses to those comments are provided in the following discussion.

a. EPA suggested that a larger suite of analytes, in addition to uranium and molybdenum, should be sampled for. EPA would include an evaluation of trichloroethylene ("TCE") and polychlorinated biphenyls ("PCBs"). The state's answer is that in conducting the RI, a complete suite of analytes was evaluated. Based on the RI analyses, the contaminants associated with the Cotter Facility were identified. Correlations between the presence of one analyte with groups of other analytes was established and, accordingly, target contaminants for sampling were identified. For example, standards for selenium and arsenic are exceeded in the Old Tailings Pond area. The standard for selenium is also exceeded to the DeWeese Dye Ditch. However, the chemical behaviors of selenium and arsenic are such that, if the flushing program is as successful for uranium and molybdenum as is expected, concentrations of selenium and arsenic will also be reduced to below standards. There is no evidence that the site is presently contaminated with TCE. Even if there were TCE con-

tamination on-site, EPA admits, itself, that "soil analyses do not need to include TCE, as this constituent is not persistent." (Exhibit 23, p. 11, para. 2.) When on-site soils were first sampled, PCB contamination was found in limited areas. Cotter removed contaminated soils, then took samples. The sampling data indicated successful removal of PCB-contaminated soils to below applicable health-based standards, thus concluding the PCB matter.

b. EPA stated that other metals besides uranium and molybdenum should be used to evaluate compliance in Lincoln Park. This comment indicates some confusion on the part of EPA. The Lincoln Park ground water monitoring is designed to evaluate the effectiveness of the flushing in the Old Tailings Ponds area. Compliance is to be determined on-site.

c. EPA stated monitoring well No. 337 should not be used as a background well. The state answers that the molybdenum concentration in well No. 337 is comparable to other background data. Its construction and monitoring history are also acceptable.

d. EPA questioned why, for the northeast and northwest (NE/NW), the class B wells are not monitored after the initial sampling phase. The state explains that the class B wells are used only to determine whether, under present conditions, a hydrological divide exists. If a divide exists (RAP

section 10.2(3), p. 99), the pathways may be reestablished by remedial activities. A renewed presence of the pathways would become evident through increasing concentrations of contaminants in the ground water and would trigger additional remediation. If no divide currently exists then the pathways currently exist. Then the issue is whether contaminant concentrations in the ground water along these pathways exceed the background range. If so, remediation must be initiated. The class A wells will be monitored throughout the remedial period to determine contaminant concentrations in the ground water.

e. EPA observed that the potential effects of change in Eh or pH on contaminant mobility with respect to steady state are not addressed. Additionally, EPA suggested that Eh and pH should be evaluated by borings in the existing tailings. The state answers that the statistical procedure provided for in the RAP should detect any increases in contaminant concentrations resulting from changes in flow caused by remediation activities (especially flushing and the section 9/16 barrier) or from changes in geochemical environment. Either event would trigger further study and may require additional remediation. Placing borings in the existing tailings was rejected to avoid puncturing the hypalon liner. The Eh and pH of the tailings are likely to be variable. In any case, it is uncertain how the data would be used since chemical fixation is not part of the remedy.



f. EPA wondered about the significance of the TDS standards for Lincoln Park. The state explains that the TDS standard is one of the standards established by the Colorado ground water regulations that apply, as an ARAR, at the Cotter Facility.

g. EPA believes the concept that meeting water quality standards at Lincoln Park means that upgradient contaminant sources have been remediated is very misleading, because the source of the contamination (e.g., selenium and arsenic) has not necessarily been treated or removed from the site. The state explains that to meet the Lincoln Park ground water quality objectives, the concentrations of uranium and molybdenum must be reduced three orders of magnitude, while concentrations of selenium and arsenic need only be reduced one order of magnitude, or less, to meet applicable standards. Thus, if the flushing program is successful for uranium and molybdenum, which success will be determined by monitoring data from the Lincoln Park wells, selenium and arsenic concentrations will also be reduced sufficiently to meet standards. Final compliance standards for the remedy are to be established on-site, at the points of compliance, not in Lincoln Park.

h. Also regarding Lincoln Park, EPA stated that one well in Lincoln Park is not adequate to serve as a point of compliance well as specified under RCRA. First, it should be

understood that the Lincoln Park wells are used to evaluate the on-site flushing program, they are not compliance points. RAP section 14.1.5.4 identifies the points of compliance on-site. The state agrees that more than one well for Lincoln Park monitoring is feasible and Cotter has agreed to monitor two wells to evaluate attainment of the Lincoln Park ground water quality objectives. The RAP has been changed accordingly. The existing data base, the monitoring program established by the RAP, and the parties' agreement to use two wells as the Lincoln Park Monitoring Well are sufficient measures to ensure protection of ground water quality in Lincoln Park.

i. EPA commented that the objectives of the ground water monitoring program should include verification of the proposed ground water model. The state agrees. The ground water model is only a tool to predict when field testing of the effectiveness of the SCS barrier and ground water flushing program can be initiated. Compliance with standards or criteria are not based on this model. Further, this model will be reevaluated by the state on an annual basis and updated based on new information and data as it becomes available during remedial activities.

j. EPA feels there should be several monitoring points downgradient of the dam to ditch flushing. The state notes that RAP section 15 does require the monitoring of at least 11 downgradient wells.

k. EPA commented that the less than 100 mesh fraction of soil and sediment samples may introduce unacceptable sampling biases by removing preferentially contaminated size fractions. EPA suggested that dust samples be collected separately and analytically compared to unsorted soil samples. The state responds that this requirement was used to evaluate the wind blown samples and was not intended for the on-site soil evaluation. The parties agree that such sizing is inappropriate for the evaluation of on-site and adjacent soil surveys required under 40 C.F.R. sec. 192 (1987). RAP sections 21 and 24 have been modified to reflect this.

#### 4. Ground water.

A significant portion of the RAP was developed to address ground water contamination at the Cotter Facility. EPA commented extensively about the source control and ground water treatment measures set out in the RAP. EPA's remarks fall generally into three categories: ground water treatment techniques; ground water monitoring well placement, construction and operation; and the ground water model. The following discussion summarizes EPA's comments and provides the state's responses to those comments.

a. One of the treatment techniques to be utilized under the Settlement is flushing out ground water contamination

in the Lincoln Park area by pumping clean water through that ground water system. EPA commented first that flushing is technically and legally inadequate, second that the RAP should present a treatment technology for the flushing program, and third that flushing should remove all contaminants, not just uranium and molybdenum. The state responds that the feasibility study ("FS") demonstrated that attempts to collect the ground water in the Lincoln Park area would decrease the time required to clean the ground water, but only in limited areas and that in the remainder of the aquifer, waters would retain contamination. Furthermore, CERCLA section 121(b) encourages the use of alternative and innovative cleanup methods. With regard to EPA's request that a specific technology be presented, the state notes that it is consistent with EPA guidance and more appropriate to perform design studies after the remedy is selected. (See Superfund Remedial Design and Remedial Action Guidance; OSWER Directive 9355.0-4A, June 1986, pp. 2-5.) The flushing program is designed to remove elements which exceed current criteria. Except in the immediate vicinity of the intersection of the DeWeese Dye Ditch and Sand Creek, and areas upgradient, the ground water meets federal and state drinking water standards. Selenium standards are slightly exceeded. Only uranium and molybdenum exceed standards established by 40 CFR parts 192 and 264. The flushing program, if properly implemented, will correct

selenium, uranium and molybdenum exceedances. In the future if other applicable standards are violated, further remedial action may be required (Consent Decree sections XXIV.E and G). The SCS barrier should also contribute to improvements in ground water quality. Moreover, no health risk is posed because the remedy requires that water for domestic consumption in the affected area be provided by hookup to the Canon City water system. Thus, the primary pathway of exposure by humans to contaminants in the ground water will be eliminated.

b. EPA also felt that the RAP should be modified to establish criteria for the pilot flushing program and that the program should evaluate cleaning up all problem metals and organics at the site. The state answers that the RAP does contain pertinent criteria. Section 8.2.2.b states "[t]he pilot study shall include the development of a ground water model ... to predict and evaluate the performance of the ground water flushing program." Section 8.2.2.d states "[t]he pilot study shall be performed to allow the testing of the design concepts to achieve the ground water quality objectives stated in Section 14...." The organics introduced by the milling process are predominately kerosene and amines, which will evaporate and thus should not persist. Samples of the fluid from the underdrains of the main impoundment did not contain detectable quantities of these substances. TCE and PCB's have already been discussed in section

I.B.3.a., supra. Selenium will tend to be removed with the uranium.

c. EPA suggested that the travel time of the ground water between the SCS barrier and the Lincoln Park monitoring point should be estimated by injecting a tracer. The state examined this issue and concluded that the travel time can be estimated by evaluating concentrations in Lincoln Park following the dewatering for the SCS barrier, and again following the flushing between the SCS dam and the DeWeese Dye Ditch.

d. EPA commented that the proposed decision to permit ground water flushing system cessation should be made on the basis of field data, not model prediction. EPA was also concerned about the lack of rationale for projections that flushing may be completed in 16 years. In response, first the state agrees that flushing will not be permanently discontinued on the basis of model prediction. Initially, flushing will be temporarily stopped to enable Cotter to demonstrate, through actual monitoring data that the required level of cleanup has been achieved. Based upon evaluations made during the feasibility study, the state projects that the flushing technique can attain the specified cleanup goals within 16 years. Therefore, the RAP specified 16 years as a design parameter. However, flushing will be continued until the Lincoln Park ground water quality objectives are met or technological limits of the flushing technique have been

reached, even if flushing must continue beyond 16 years.

e. EPA stated that the RAP does not specify the source of flushing water. The state notes that there are several possible water sources. The RAP requires that the state approve the quality of the water used.

f. EPA made a number of specific comments about ground water monitoring well placement, construction and operation. Commentors suggested that forms for wells and piezometers should be completed by a geologist/hydrologist with final approval by the state inspector; that all wells should be developed using the surge block and bail or pump method; that withdrawal wells should be installed using a staged approach; and that RAP section 3.2.1.4 should require all wells and piezometers to be surveyed to the nearest 0.01-foot interval. Having considered the comments, the state indicates that the level of detail concerning well and piezometer development will be addressed in the quality assurance/quality control plan and final design documents, consistent with EPA guidance. In the absence of data, some overdesign (i.e., closer well spacing) of the withdrawal well system is probably warranted. RAP section 3.2.1.4 does require measurement to the nearest 0.01 foot for piezometers when hydraulic heads are compared. All activities and submissions are subject to review and final approval by the state thereby assuring appropriate terms, well design and construction.

g. EPA commented that it does not approve bladder pumps. The statement in the RAP is not intended to imply that the EPA has a formal approval process for pumps. Rather it refers to the fact that EPA finds these pumps acceptable for the proposed use. The state notes that EPA guidance states that bladder pumps are "acceptable sampling devices for all parameters." (See RCRA Ground Water Monitoring Technical Endorsement Guidance Document, OSWER-9950, September 1986, page 105; also see EPA Handbook Groundwater, EPA/625/6-86/016, March 1987, Figure 6-4).

h. EPA recommended that if piezometers for the withdrawal wells indicate that drawdown is not being maintained, the pump rates should be increased. The state answers that if the drawdown is not being maintained, Cotter must modify its program to accomplish this. It is inappropriate at this time to specify the action to be taken since such a decision must be based on actual field conditions present at the time.

i. EPA commented that monitoring in Lincoln Park should be done with more than one well and indicated that it is not clear if wells or piezometers will be installed in conjunction with the designated Lincoln Park monitoring well. The state answers that other wells and piezometers will be installed in the Lincoln Park area as part of the remedy. Two to four piezometers will be installed near the two Lincoln Park monitoring wells for



the purpose of determining the hydraulic gradient near each well, so that changes in measures of uranium and molybdenum flux can be determined.

j. EPA expressed the concern that flooding the secondary impoundment may impact ground water. The state's analysis shows that the use of the secondary impoundment for liquid disposal will not adversely impact the ground water.

k. A number of EPA's ground water comments focused on the use of ground water modeling in the Settlement. EPA states the model does not define input parameters; the model is not based on empirical data such as field sampling; it is unclear how the model will be used for compliance purposes; the model cannot be used to determine compliance; the state should be permitted to disagree with the model; temporary cessation of flushing should not be based on the model alone; and a pilot study should be used to evaluate the feasibility of establishing minimum cleanup criteria as an alternative to the model. This series of comments suggests that EPA has not fully understood the use of the ground water model. The ground water model must be capable of evaluating the hydrogeology and geochemistry both on-site and off-site. In approving this model, the state will evaluate it against current models used by the state for other projects. Initial development and calibration of the model will be based on site-specific monitoring data. Furthermore, there is not a

one-time approval of this model. It will be up-dated and reevaluated every year as more data are collected. Input parameters are not specified because technology for hydrogeologic and geochemical modeling is changing rapidly, techniques available today will soon be out of date. Thus, input parameters may be changed as the model is updated. The state can disagree with the model. The model will not be used for compliance, the model only identifies when Cotter can apply for temporary cessation of the flushing program and the SCS barrier so that Cotter can perform the actual monitoring under field conditions. The criteria that have been established for Lincoln Park ground water quality are protective of human health and the environment. Moreover, Cotter must perform remediation until after alternative concentrations limits are established pursuant to section 14.1.5.7 (incorporating all health and environmental requirements of 40 CFR 264.94(b) and (c), and of section 121 of CERCLA).

1. EPA also suggested that the efforts of the SCS barrier and main impoundment pumping should be taken into account in the model. The state agrees and the RAP so provides. The model is to be reevaluated annually so that such data can be considered. Section 7.2.1.k. states "The ground water model required... shall be updated based on soil and substrate condition encountered during construction of the SCS hydrologic barrier." The mill area-Lincoln Park model will include the area

from the hogback south of the mill to, effectively, the Arkansas River. Any pumping or injection activities in this area will affect ground water flow, and would be specified as boundary conditions in the model. This includes the impoundment withdrawal wells, the 9/16 barrier, the SCS dam pumpage, the dam to ditch flushing, and irrigation-related recharge in Lincoln Park.

m. EPA recommended that, in order for the model to produce meaningful 2- and 3-dimensional results, both north-south and east-west directions must be taken into account. EPA was concerned the model will not address these needs. The state answers that RAP section 8.2.2.0., p. 64, describes model requirements for the mill area and Lincoln Park, and specifically mandates that 2- or 3-dimensional techniques will be used.

#### 5. Specific liquids and materials management units.

EPA made several very specific comments regarding particular liquids or materials management units at the Cotter Facility, including the surface impoundments, the ore stockpile areas, the Wolf Park Mine shaft, and the SCS barrier. EPA's comments are summarized and the state's responses provided in the following discussion.

a. Regarding the ore stockpile area, EPA commented that the adequacy of the clay pad under the pile should be evalu-

ated. The state has evaluated the pad and found it to be appropriate.

b. EPA commented that the existing surface impoundments should not be used if they are leaking. The state has considered these comments and responds that though the state has suspected that the impoundments are leaking, leakage cannot be readily determined by monitoring data because the impoundments were built over soils containing materials which are identical to those now contained in the impoundments. Moreover, if leakage is occurring, it is minor in comparison to other contamination sources. Because the evaporative rate of the impoundments exceeds potential leakage, and because the withdrawal wells will collect the leakage, the use of the impoundments is protective of the environment.

c. EPA was critical of the standard used to determine whether the impoundment must be neutralized and of the calculations of the quantity of leachate that can be neutralized by the liner. EPA suggested a study to evaluate actual flow through the impoundment liner and long-term changes to the liner. The state responds that RAP section 7.4.4 provides that if the tailings are adversely impacting the liner, and if it is feasible to neutralize, then Cotter must neutralize. Studies performed by Pacific Northwest Laboratories, Batelle, on the performance of clay liners in contact with acidic uranium mill tailings solu-

tions indicate that neutralization of the solution by the clay causes a reduction in the liner permeability. However, if the pH-buffering capacity of the clay is exceeded, and neutralization stops occurring, the clays and the precipitates may dissolve as low pH fluids move through the liner, causing an increase in permeability over that originally present. Therefore, in order to evaluate the flux through the liner over the long term, as requested by the commentor, it is necessary to first evaluate the neutralization capacity of the clay liner in order to predict changes in its permeability.

d. EPA commented that flux cannot be determined from the calculation described in RAP section 14. The state responds that the RAP purposely uses the phrase "measures of ... flux," rather than "flux." The RAP addresses those parameters which will cause a change in flux (concentration, saturated thickness, and hydraulic gradient) and defines how those will be determined. For these purposes, agreeing on the hydraulic conductivity is not necessary. Even though hydraulic conductivity will be variable in the Lincoln Park alluvial and fan materials, it will not change significantly with ground water flow through that area. The determination of measures of flux rather than flux is necessitated by the technical and practical difficulties of obtaining agreement upon the hydraulic conductivity.

e. EPA had three comments concerning the distribution pond proposed in the RAP: 1) the pond is to be located where unlined pond 7 used to be, yet no remediation is required; 2) the distribution pond design is not specified, and 3) an off-site source of clay is needed. The state answers that pond 7 was a fire water pond; it only contained clean water. Consequently, no remediation of that location is necessary. The design of the distribution pond, including drawings and specifications, was submitted to the state in 1984. The RAP requires that it meet the requirements of 40 CFR 192.32(a)(1) (i.e., there shall be no migration of wastes out of the impoundment to the adjacent subsurface soil or ground water or surface water during the active life of the impoundment and the liner shall be removed at impoundment closure). Cotter is required to submit soil data from potential borrow areas to the state for approval. If it is determined that no on-site soils are suitable, then their use will not be permitted and off-site sources must be used.

f. EPA raised several questions about the SCS barrier. First, EPA remarked that there is no provision for limiting ground water flow under the SCS barrier. Second, EPA recommended that only clay capable of compaction to at least 0.0000001 cm. sq. should be used. Lastly, EPA feels that permanent cessation of the SCS barrier and flushing system should not be permitted until such time as it can be proved that upgradient releases

will never cause Lincoln Park ground water quality objectives to be exceeded. The state responds that RAP section 9 requires the installation of a barrier to limit the flow of ground water under the SCS dam. The RAP and reference submittals require that the barrier be founded in the shale layer and that the downgradient wall be relatively impermeable. The state agrees and the RAP provides that barrier permeability of no greater than 0.0000001 cm/sec (note that EPA used the wrong units, cm. sq., rather than cm/sec) should be achieved. Though it cannot be guaranteed that Lincoln Park ground water quality objectives will never be exceeded after remedy completion, the remedy is expected to meet this goal. Moreover, compliance with 40 CFR 192, incorporating 40 CFR 264, assures that compliance monitoring will continue through closure and postclosure.

g. EPA also commented extensively about the Wolf Park Mine shaft. EPA considered proposed remedial activities inadequate to address fully potential deep ground water contamination. So, EPA suggested that the deep aquifer be characterized and that water sampling should include water levels. In addition, EPA would like at least 3 wells with screened intervals of 10 feet for in-mine monitoring. In contrast, one EPA commentor said the mine should be grouted (i.e., sealed), not studied. The state answers that the RI identified a potential for Cotter contaminants to enter the mine shaft. Contamination in the mine

shaft was very evident in the past when the old tailings ponds were in use. More recent data have not shown conclusively that the mine shaft is still a pathway, but are also not sufficient to indicate that the pathway no longer exists. Hence, there is a need to collect additional data. Directions of movement in the deep flow system are poorly known, but contaminants would be widely dispersed because of the high-permeability mine passages. Based on this analysis it has been determined that even if the ground water in the mine has been impacted, remediation of the ground water in the mine is not feasible. Rather, source control appears to be the best alternative. The selected remedy will enable the state to determine whether a pathway exists (i.e., whether water is seeping into the mine from a Cotter source), and if it does, the pathway will be eliminated. The state notes that well 339, which was drilled into the mine workings, will be monitored for both chemistry and water levels. A new monitoring well (018) will also be monitored for chemistry and water levels. To require that the mine shaft be grouted when a pathway from a Cotter source is not known to exist would not be a cost-effective remedial action.

#### 6. Miscellaneous general comments.

The remaining comments made by EPA were of a general nature or could not be readily grouped. These comments are summarized



and will be responded to in this section.

a. EPA noted that the source studies from which on-site and off-site impacts are defined are not identified. The state's basis of knowledge for this site comes from 19 years of licensing, studies performed for the RI pursuant to the NCP, and studies conducted by the U.S. Geological Survey under contract with EPA.

b. EPA observed that no explanation is provided as to the purpose of the discussions with each person whose well was surveyed as part of the Lincoln Park water use survey. The state explains that the proposed discussions are consistent with community relations objectives of NCP section 300.67 and will ensure that each person is aware of the results of the sampling and provided with any recommendations and/or other appropriate information.

c. EPA commented that the Settlement only requires Cotter to pay incremental costs resulting from the replacement of ground water supplies. CERCLA would require them to pay the full costs of any response actions required. The state responds that with regard to replacement of ground water supplies in this case, the incremental additional cost is equal to the full cost of the required response action. It would not be appropriate, nor would it be consistent with CERCLA or the NCP to require that Cotter pay the entire cost of the water supply to each person affected

by the presence of contaminants in the ground water supplies when each such person incurs some cost for his/her water supply at the present time (such as the cost of electricity to operate a pump). Only the additional cost incurred in switching to and maintaining an alternative supply should be borne by Cotter.

d. EPA stated that in RAP section 3, the significance of "steady state conditions" is not presented, and the monitoring time period is not given. The response is that the relationship of steady state conditions to monitoring conditions is presented in specific sections of the RAP. Those sections also specify schedules under which this condition must be evaluated.

e. EPA suggested that the RAP should include a spread sheet showing time frames for each activity. The state answers that time frames for each activity are clearly specified in the RAP.

f. EPA feels the RAP must define how each statistical test will be used. EPA suggested that a student t-test, which has been demonstrated to be adequate for similar programs, could be used. In response, the state notes that RAP section 3.2. identifies the statistical tests that will be used. Subsequent chapters of the RAP refer to these tests. A student t-test is used to evaluate steady state conditions. The state finds these approaches to be protective of human health and the environment.

g. In EPA's opinion, the outline for evaluating ephemeral streams and the Fremont Ditch is not adequate to include all possibilities that may be encountered as a result of the study. The state's evaluation indicates that the proposed actions are appropriate. Moreover, the state will have the opportunity to review and approve Cotter's plan for evaluating the ephemeral streams and Fremont Ditch.

h. EPA noted that Lincoln Park residents have commented that wastes (allegedly resulting from transport and disposal of Manhattan Project wastes) may be present in the vicinity of Lincoln Park. EPA suggested that this concern should be addressed in the RAP. The state responds that catalysts and radioactive materials were alleged to have been spilled during transport to the Cotter Facility. The state has begun an investigation into these allegations. The state does not believe that the implementation of the remedies identified in the RAP should be stayed until this investigation is complete. Identifying the party or parties responsible for spilling any hazardous substances may take years. If it is determined that Cotter is the responsible party, the Consent Decree has provisions for requiring additional remediation based on new information.

i. EPA believes that interim remedial actions should be proposed for perennial streams. The state responds that removing sediments from streams will cause ecosystem dis-

turbances and may have detrimental effects on those streams. Prior to mill closure, the streams may collect additional small amounts of contaminants. The state does not believe it is appropriate, based on monitoring data showing relatively low levels of contamination, to cause such disturbance now and again at mill closure.

j. EPA expressed concern that it is not included in the reviewing schedule. The state responds that this Consent Decree relates to the suit filed by the State of Colorado against the Cotter Corporation. EPA was not a party to the suit. The state, acting as lead agency for NCP purposes, is the entity to review and enforce the provisions in the Settlement. Moreover, the state plans to continue to consult with EPA, as provided by the MOA, during remedy implementation.

k. EPA suggests that the wording of section 3.3.1 should make clear that the annual report is to be submitted on an annual basis. The state responds that the existing language "The RAP Annual Report ... shall be submitted by Cotter to the state by June 30 of each year after the entry of the Consent Decree by the Court" requires no further clarification.

l. EPA observed that the RAP contemplates that remedial activities designed to obtain the ground water compliance standards will not begin for 20-30 years. EPA also believes that all remediation activities prior to this time are designed

to contain the existing contamination and prevent further contamination off-site. EPA may have misunderstood the full scope of remedial activities. The state notes that one major activity to remedy and clean up the contaminated ground water is to flush the major source of these contaminants. The schedule for these activities is in section 8.4 and the first Cotter submission to the state is due within 60 days of the entry of the Consent Decree by the court.

II. COMMENTS FROM THE PUBLIC ABOUT THE  
CONSENT DECREE AND THE REMEDIAL ACTION PLAN  
AND THE STATE'S RESPONSES TO THE PUBLIC  
COMMENTS.

Comments from the public concerning the Settlement were received both at the public meeting held in Canon City on January 5, 1988 and in writing during the public comment period. Public comments can be grouped into eight (8) broad categories: General Comments, Scope of the Remedy, Remedy Oversight, Public Participation, Private Injuries, Water Rights, Sampling and Monitoring, and Health Risk Assessment Panel. The public comments are summarized and the state's responses to the public comments are provided in this section II. of the Consent Decree Comments and the Plaintiff State of Colorado's Response Summary. Similar comments from more than one member of the public are grouped together to avoid repetition. All public comments are attached

as Attachment B, Exhibits 1 through 22 and 24 through 67. Each written comment being responded to is listed parenthetically after the summary of the comment. The transcript of the January 5, 1988 public meeting is also attached, as Attachment B, Exhibit 70.

1. General comments.

a. One commentor asked what damages were sustained (3). The state answers that air, surface water, surface soils, and ground water have been impacted by operations at the site. The agreement for payment by Cotter consists of 4 components:

- (1) Past costs for case preparation, consultants, attorneys, and Health Department (\$2,000,000);
- (2) Future costs of oversight (\$1,200,000);
- (3) Damages assessed under section 25-16-201, C.R.S. (1980 Supp.) (\$1,000,000); and
- (4) Recovery related to enforcement of the Colorado Hazardous Waste Management Act (\$250,000).

b. Another commentor asked why penalties were reduced from \$50,000,000 per release to \$1,000,000 (31). The \$50,000,000 per release is a ceiling under CERCLA. The amount of damages specified in the Settlement is based upon a damages assessment conducted by the state. The assessment indicates that the statutory maximum level of damages would not be appropriate

in this case. The agreed upon remedy will mitigate damages and achieve settlement goals of the state and the public by providing a means to clean up the site without protracted litigation. Implementation of the remedy required by the Settlement will also reduce overall damages.

c. A commentor stated that the Environmental Protection Agency prodded the state into action (17). The state answers that the State of Colorado, not the EPA commenced and litigated this civil action in federal court.

d. One commentor expressed concern that the language in the Consent Decree stating that the remedy is in accord with 40 CFR secs. 300.68(i)(1) and 300.71(a)(ii)(c) of the NCP was intended: 1) to preclude EPA from requiring further remediation and 2) to replace requirements in the RAP for testing and implementation of remedial action until background ranges are achieved (31). The state responds that the reader misunderstood the statement. The language questioned is the states's determination that the Settlement is consistent with the NCP. The Consent Decree reserves to the EPA rights otherwise legally available to it. The RAP contains applicable cleanup standards in each section.

e. One commentor suggested that the remedial action plan be appealed to a court involving the federal government (13). The state explains that the civil action resulting in

the Settlement was filed in the United States District Court, Colorado District.

f. A commentor states that "Julia Turney of the Colorado Department of Health said her [the commentor's] property was radioactive." (14) The RAP recognizes that off-site soils may have been impacted by Cotter's activities. Thus, RAP sections 24 and 25 address site adjacent soils and Lincoln Park soils. Soil from properties located within the areas to be further evaluated and remediated pursuant to those sections will be sampled and cleaned up, if necessary. If during implementation of the remedy new information is obtained showing soils contaminated from Cotter's activities in other areas beyond those delineated in RAP sections 24 and 25, additional remediation may be required.

g. Several commentors stated that Cotter Corporation should be denied their Radioactive Materials License. The state answers that it must issue a Radioactive Materials License when all applicable law is adhered to in the application and supporting documents. Moreover, this case was not initiated as a means to suspend or revoke a license, rather, its purpose was to cleanup released hazardous substances and to remedy any natural resource injuries caused by such hazardous substance releases.

h. A commentor stated that 360 days is an unreasonable delay in submitting designs and schedules (in the event



NE, NW pathways need to be remediated) for construction (31). The state responds that engineering plans and specifications cannot be developed without time to conduct appropriate field work and analysis of data obtained through the field work.

i. A commentor remarked that ground water has not been demonstrated to follow the Sand Creek channel (24). The state answers that all available data, including piezometric data, supports the ground water transport characteristics in the shallow aquifer as described in the RAP.

j. The same commentor suggested that seasonal effects on ground water quality need to be considered in statistical treatment (24). The state agrees. Seasonal effects will be considered.

k. One commentor remarked that the remedy would cost hundreds of jobs and should be paid for by the federal government or that Cotter should be exempt from CERCLA (1). The state responds that the Settlement was not, itself, the cause of lost jobs. Remedy implementation should increase the level of employment in the community. Cotter is subject to CERCLA. By enacting CERCLA, Congress established which parties are responsible for cleanup costs and damages.

## 2. Scope of the remedy.

a. One commentor suggested that the remedy was

"overkill;" that compliance objectives are too low and unachievable (60). Many other members of the public commended the parties' efforts to achieve an agreement, lauded the agreement, and requested that the remedy be implemented as soon as possible. The state believes the Settlement is achievable and, when implemented, will constitute a comprehensive site cleanup that will be protective of public health and welfare and the environment.

b. Several commentors were concerned that the geographic area of the remedy was too limited; that injuries are more widespread than acknowledged in the Settlement (5, 6, 9, 11). The state responds that the Settlement is designed to cleanup all hazardous substances released from the Cotter Facility that have injured or present a risk of injuring public health or welfare or the environment. Provisions in the Consent Decree include additional studies to ensure that the full extent of contamination in the vicinity is addressed by the remedy.

c. Several commentors requested that their wells be sampled and that they be advised of the analytical results (4, 5, 7, 9, 10, 11, 12, 18, 20, 24, 26, 28, 29, 31, 32, 33, 35, 36, 38, 39, 42, 44, 46, 51, 53, 54, 57, 58, 59, 61, 64). The state responds that an appropriate study area for ground water well sampling and use surveying has been identified. Those individuals who own a well in the study area and wish to be informed of

their well sampling results will be mailed a copy when available. The survey of well use will not be limited to the time the survey is performed, but will reflect any seasonal use. Individuals not in the study area wishing to have their well water analyzed may do so at their own expense through the CDH chemistry lab or through any private lab they choose.

d. One commentor expressed concern about a 12" tile draining from Sherman Avenue to Park Avenue in the vicinity of 1539 Park Avenue that diverts water to Rouse Park (10). The state answers that the remedies should improve all downgradient areas. Localized subsurface features are not expected to have any significant affect on the implementation or success of the remedy.

e. Two commentors asked whether remedial action is protective of the Pueblo Reservoir, the Minnequa Reservoir, the Arkansas River, the Pueblo Water Supply, and fisheries (11, 31). The response is that cleanup pursuant to the Settlement is anticipated to be fully protective of these resources.

f. Several commentors were concerned about the effects of septic systems and leach lines on contaminant transport. Others requested that a sewer system be installed (2, 18, 30, 53). In response, the state notes that septic systems and leach lines should have minimal effect on the transport of contaminants. Installation of a sewer system would not remedy

ground water contamination from mill sources.

g. One member of the public requested that the May 15, 1986 RAP be implemented as the remedy (2). The response is that the May 15, 1986 document was merely the outline of a remedy but did not conform to the NCP and did not contain enough detail to meet statutory or regulatory criteria.

h. Several persons expressed concern about 2 contaminated sites reported during the comment period (6, 9, 31, 49). The two sites mentioned in the public meeting are currently being investigated by the CDH. Samples have been taken and are being analyzed. Once the spilled materials have been identified and a determination made as to their hazardous characteristics, appropriate cleanup action will be instituted.

i. One commentor questioned whether the state is aware of radon and radioactivity in water in Coal Creek Canyon (9). The state is aware of the radon and has been an active participant in meetings with Coal Creek Canyon residents regarding the radon contamination.

j. One commentor indicated that some people in Lincoln Park fear that their land is contaminated by mill residues (60). The state responds that current soil information indicates that such fear is unfounded. Additional soils studies to be conducted under the Settlement will further quantify contamination and risks. If public health or welfare or environ-

mental risks are presented by contaminant concentrations in soils, appropriate cleanup action will be required.

k. Other commentors feared that flushing and leaking will increase contamination (63, 64). To the contrary the ground water flushing will reduce contamination.

l. Various commentors were concerned about replacement of soil on "public" but not "private property" (41, 43). In response, the state notes that remedial activities including soil removal will occur where it is determined to be necessary regardless of property ownership.

m. Commentors suggested that Cotter is absolved from action under paragraph 8.2(4) of the RAP (24, 31). The referenced provisions allow flushing to be discontinued only when technological limits are achieved and the state concurs. These provisions do not relieve Cotter from taking action, but simply acknowledge that once all cleanup benefits from flushing have been achieved, that technology will not continue to be implemented.

n. One member of the public recommended that a water budget be prepared (24). The state answers that if evaporation and holding capacities prove to be inadequate, remedy modifications may be required. Lack of surface impoundment capacity is not, however, a basis to preclude completion of any of the remedial activities included in the Settlement.

o. One commentor requested greater detail about locations, depths and completion details for wells (24). The state answers that most existing wells have known completion details, all new wells will have known completion details. Construction plans will contain explicit quality assurance and quality control ("QA/QC") procedures and specifications. The design phase will include necessary details regarding well location, depth and completion.

p. Two commentors were concerned about the result of a determination concerning the surface impoundment clay liner, that a plan to effectively minimize and mitigate significant degradation of the clay liner is "necessary but not feasible" (31, 49). The state answers that the remedy incorporates a system of ground water wells to intercept leaking water, if any, from the surface impoundment. This method is more protective than attempting to construct a new impoundment, which could also be degraded.

q. Several concerns were expressed about the effects of interconnections between the Wolf Park Mine and mines in adjacent sections. These include the NoNac No. 5; Pearless (Pearson?), at 9th and Elm running N. to Grand & E. to Walnut; Lovesone Mine west of Brookside on Ash (which may interconnect to the Chandler); Pokes Mine, west of Brookside on Ash and south of Lovesone (ca. 1000') in the Willow Creek drainage; and the

Brookside Mine, which may connect to the Chandler in Fawn Hollow. It is noted that some mines also provide a source of emerging surface water during part of the year (17, 28, 31, 36). The state answers that if a pathway of contaminant seepage from the Cotter Facility into the mine is identified, sealing the Wolf Park Mine shaft will prevent any continued seepage of contaminants into the mine from Cotter activities. In the event new information indicates that a problem exists, additional actions may be taken if substantial adverse effects are identified and can be linked to activities at, or hazardous substances releases from, the Cotter Facility.

r. One commentor questioned whether the state and Cotter have negotiated to a point where there will be less than total cleanup of the polluted areas (13). The Settlement requires comprehensive site cleanup that will meet all applicable or relevant and appropriate standards and will be protective of public health and welfare and the environment.

### 3. Remedy oversight.

a. One commentor suggested that the Colorado Mined Land Reclamation Division may have jurisdiction over the reclamation plan (45). The state notes that reclamation following mill closure is expressly not part of the Settlement. The Radiation Control Division has lead authority for the final reclamation plan.

mation plan, but will seek Mined Land Reclamation Division input.

b. The U.S. Nuclear Regulatory Commission ("NRC") requested the opportunity to review reclamation plans (67). The state explains that the reclamation plans pertain to licensing requirements and are not addressed in the Settlement. As the reclamation plan is developed, participation by the U.S. NRC will be encouraged.

c. Several commentors were concerned that Cotter may be able to manipulate or control findings (6, 31). Other commentors were apparently unaware that an on-scene coordinator ("OSC") from the state will oversee remedy implementation (28, 30, 39). Another commentor suggested the state should select Cotter's manager (31). The state responds that the state will have adequate oversight of remedy implementation through its OSC. The function of the OSC is to assure that the Settlement is fully and properly implemented. Cotter will select its own manager who will then be responsible for working with the OSC to assure proper implementation of the remedy.

d. Two commentors wanted Cotter to fund a completely independent committee to oversee both the state and Cotter corporation, including oversight of sampling (40, 49). The state responds that the proposed oversight plan contained in the Settlement conforms to the NCP and will efficiently ensure proper implementation of the remedy. The commentors' proposal,



although achievable, is not cost-effective.

4. Public participation.

a. A number of commentors complained of the lack of opportunity to review the Consent Decree and RAP, and the absence of opportunity to review any evidence in this case. These commentors felt that distribution of information to the public was inadequate (3, 9, 29, 47). The state responds that 93 notices of the issuance of the Settlement documents and their availability were distributed. The Settlement documents were made available from the beginning of the comment period, in public libraries at Canon City, Pueblo, Colorado Springs, and Denver. The interim reports prepared by Cotter and state consultants, and the RI/FS, were available in the libraries of Pueblo, Canon City, and Denver. These reports contain all data and "evidence" in the case. Formal documents will continue to be available at the above-listed repository libraries.

b. One participant felt the comment period was too short (11). The state notes that the comment period conformed to the community relations requirements of the NCP and CERCLA section 117 and was further extended by one week. Ninety-three formal notices announcing issuance of the Settlement documents and their availability were distributed. Local government, environmental groups and news media were sent copies of the notice.

Twenty-two copies of the Consent Decree were distributed.

c. One commentor was unable to interpret the results of well sampling from his/her well (22). The state explains that the uranium concentration should be subtracted from the "Gross alpha" value. The result is within safe drinking water standards and guidelines.

d. One commentor was concerned that assertions about RAP components made at the public meeting are not actually in the RAP. For example, only two drainages are included in the RAP (17). The state responds that the remedial activities and additional studies required by RAP sections 10, 12, 13, 14, 15, 24, 25, 26, 27, 28, 29, 30 and 31 reference all 5 drainages and will address all mentioned concerns.

e. Another commentor wishes to commission another independent study (63). The state notes that the remedy will be finally selected upon entry of the court's Order. More progress can be made now by remedy implementation.

##### 5. Private injuries.

a. A number of commentors indicated they have suffered damages to their private property, from reduced land values to death of thoroughbred horses from cancer, and requested restitution for their injuries (2, 3, 11, 12, 13, 15, 17-21, 28, 31, 34, 38, 41, 46, 48, 50-53, 56-59, 64, 66). The state answers

that the damages recovered in the Settlement are for injury to or destruction of natural resources held in trust by the State of Colorado, including a small, but cognizable, public interest in certain private property. However, damages under this Settlement were not recovered for injury to private interests in private property.

b. One commentor accused the state of theft (1). The state does not understand this remark. The Settlement includes recovery of the state's costs of obtaining the Settlement, so taxpayer funds spent on this matter will be fully recovered. Accordingly, the state disagrees with the allegations.

c. Several commentors seek property tax relief (18, 21, 53, 62). The state responds that tax relief is not available through this suit. Tax relief is properly sought, for example, by appeal of an assessed valuation through the county or the State Board of Assessment Appeals.

## 6. Water rights.

a. A number of commentors were concerned that water rights issues have not been fully addressed in the Settlement and that, as a result of the remedy, additional costs would be imposed upon Canon City residents (31, 41). The state answers that the Settlement requires Cotter to purchase and legally acquire any water rights necessary to implement the remedy. The

remedy. The costs of Cotter's acquisition of water rights and the increased costs of replacing water sources to members of the public will be borne by Cotter.

b. Two commentators observed that a lining system is being installed in the DeWeese Dye Ditch to reduce losses from the ditch to the ground water system and, therefore, the parties should not rely on irrigation water as a source of flushing water (8, 31). The state answers that in the event the ditch is lined in the region where flushing is a desired component of the remedy, the compliance objectives must still be met. Regardless of source, continued irrigation in support of agricultural activities in the vicinity will contribute water to the shallow aquifer system and enhance the flushing operations.

c. Other commentators inquired whether the use of the DeWeese Dye Ditch as a source of flushing water will diminish the amount of water available for irrigation (18, 48). The state answers that the ditch currently leaks. Therefore, to the extent only the existing leakage is used for flushing, no impact on quantity would be expected. The amount of water available for irrigation will be dependent upon ownership, use, supply, and diversions of the water carried in the DeWeese Dye Ditch.

d. Other commentators fear that the dam-to-ditch flushing will contaminate the DeWeese Dye Ditch, or that it currently is "massively contaminated" (6, 16, 28, 50, 52). The

state explains that the DeWeese Dye Ditch constitutes a recharge zone to the ground water system. Contributions by ground water to the ditch are expected to be many orders of magnitude smaller than the recharge, thus the net impact is considered to be negligible. The ditch currently acts as a source of dilution to the ground water system, and is of substantially better water quality than the upgradient shallow aquifer.

e. One member of the public requested that the parties identify and quantify how much land, wells, and "water rights" have been polluted (3). The state responds that the data presented in the remedial investigation/feasibility study show the current knowledge of the extent of contamination. Some areas are to be studied further pursuant to the Settlement.

f. One commentor accused Cotter of stealing water rights by constructing the SCS Dam (3). The state answers that the Soil Conservation Service constructed the dam as a flood control device. The U.S. Soil Conservation Service should be contacted regarding the impact, if any, on water rights caused by dam construction.

#### 7. Sampling and monitoring.

a. Several commentors questioned whether appropriate target elements had been selected for monitoring and wondered why all four target elements are not mentioned in each clean-up

section (6, 24, 31). The state answers that target elements have been selected as appropriate for each of the affected media. For example, molybdenum was selected as a target element over thorium-230 because molybdenum's solubility and mobility is greater than the solubility and mobility of thorium-230.

b. One commentor stated that thorium solubility is dependent on the isotope (31). The state notes that this statement is not supported by current scientific information.

c. Two public participants wondered whether ground water monitoring when the DeWeese Dye Ditch is operating will be accurate or whether it will simply reflect dilution (5, 6). The state answers that monitoring will occur during each season whenever water levels are sufficient to enable sample collection. Sampling will not be limited to times when the DeWeese Dye ditch is operating. Therefore, to the extent that dilution occurs, the diluted values will only be a part of the data base.

d. One commentor was concerned that there appears to be no provision for background ground water quality determination (60). The state answers that background ground water quality monitoring will be conducted pursuant to applicable requirements of RCRA and Cotter's Radioactive Materials License. (See, e.g., RAP Fig. 10-1, wells 325, 337.)

e. Several reviewers feel the single Lincoln Park compliance point well is insufficient (6, 9, 17, 23, 31, 39).

The parties agree and the RAP has been changed by adding monitoring requirements in two wells in Lincoln Park, not just one. In addition, concentrations of constituents in other wells in the Lincoln Park area will certainly be considered in the overall remedial scheme.

f. One commentor remarked that the Lincoln Park monitoring well is not connected to any other monitoring plan (6). The state responds that this perception is incorrect. The site monitoring plan includes many, many wells and is adequate to determine concentrations of contaminants in the ground water in the plateau and Sand Creek drainage areas mentioned by the commentor.

g. One commentor requested core sampling of the Minnequa and Pueblo Reservoirs (31). As stated in the public meeting, this action will be performed, if it is considered appropriate. Evidence obtained to date indicates that a negligible health risk is posed by present levels of contamination in sediments.

h. One commentor at the public meeting questioned whether the RI/FS data showed higher levels of air contamination at greater distance from the Cotter Facility. (Exhibit 69, pp. 91, 92.) In response, the state refers the commentor to RI sections 4.2 and 4.3. In particular, the analytical results reported in table 4.3-1 (p. 4-21), and in graphic form, figures

4.3-1, 4.3-2, and 4.3-3, do not reflect increasing concentration with distance from the Cotter Facility. However, copper and arsenic concentrations west of the Cotter Facility may exhibit some influence from the zinc smelter west of the site.

#### 8. Health Risk Assessment Panel.

a. A number of public commentors had questions about the composition of the Health Risk Assessment Panel. Some requested a local representative on the Panel and/or input from the Colorado Department of Health (6, 9, 14, 17, 19, 21, 29, 30, 31, 32, 35, 45, 46, 49). Others questioned the independence of the Panel (9, 31). One commentor requested that EPA select Panel members (19). The state answers that the Panel selection process, as established in the Settlement, section 32.4.2 of the RAP, provides a schedule for state review and approval of the proposed Panel members. The purpose of the on-site coordinator and the fund to support OSC activities and functions is to assure that RAP activities are performed at a high standard and to enable independent evaluation of all work, including the Health Risk Assessment Panel. The parties agree that a voluntary local community representative may act as a liason between the Health Risk Assessment Panel and the Community. If the community so requests, the state will assist the community in applying for a grant under CERCLA section 117(e), 42 U.S.C. sec. 9617(e), to



help fund participation by the local community representative.

b. One commentor suggested a complex scheme whereby EPA would select Panel members and the Panel would review only the concerns of six community members with the costs to be provided by CDH (19). The state answers that selection of topics to be addressed in the field of health risk assessment should not be limited to the identification of concerns by a local committee but should be chosen by the experts. Moreover, the Health Department does not have funding for such a panel.

c. Several commentors worried that some health problems may be discovered after the Panel is dissolved (9, 14, 28, 31, 49). The state notes that, in accordance with CERCLA, every 5 years the remedy is subject to review to ensure that human health, welfare and the environment are being protected by the remedy being implemented. In the event that imminent and substantial endangerment or substantial adverse impacts are discovered, appropriate remedies and supplemental studies may be implemented pursuant to sections V and VI of the Consent Decree.

d. One member of the public was concerned about the risks to children, if any, associated with unstated contaminant concentrations in the ground water (5). The state notes that as a part of the Settlement, hookup to city water will be provided to residences in the study area that are currently using well water for domestic purposes.

e. A number of commentors expressed concern with the concept and process of a Health Risk Assessment Panel and desired to know specific risks associated with specific pathways (i.e., ingestion of fruits and vegetables, water, or inhalation) at the present time (2, 9, 12, 13, 14, 15, 16, 17, 18, 19, 20, 26, 27, 28, 29, 31, 32, 33, 34, 35, 36, 37, 38, 39, 42, 46, 47, 49, 50, 51, 52, 53, 57, 58, 59, 60, 61, 62, 64). Identified pathways and risks associated with those pathways are discussed in chapter 8 of the RI. The purpose of the remedial action is to reduce or eliminate risk of injury to public health, welfare and the environment from the identified pathways of exposure to contaminants released from the Cotter Facility. The purpose of the "Health Risk Assessment Panel" is to better define the present risk and to assist in remedy implementation to eliminate that risk.

### III. CONCLUSION

In conclusion, plaintiff State of Colorado has fully responded to significant comments and criticisms concerning the proposed Consent Decree and Remedial Action Plan submitted to the state, orally or in writing, during the comment period, as extended. Where appropriate, the parties have agreed to modify the RAP based on the public comments. Plaintiff State of Colorado has met the requirements of CERCLA sec. 117(b), 42 U.S.C.

sec. 9617(b).

Dated this 19<sup>th</sup> day of February 1988.

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